



Service through Science

DETERMINATION OF THERMODYNAMIC
PROPERTIES OF AEROZINE-50

Appendix D to Final Report

by

JOSEPH P. COPELAND
JOHN A. SIMMONS

for

Manned Spacecraft Center
National Aeronautics and Space Administration
Contract No.NAS9-6720

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A Division of The Susquehanna Corporation
Shirley Highway at Edsall Road
Alexandria, Virginia 22314

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APPENDIX D

This appendix contains tables of thermodynamic properties and skeletal thermodynamic diagrams for Aerozine-50. For the condensed phase regions, values are listed at various temperatures along the solid-vapor or liquid-vapor boundary only, since the pressure dependency with these regions is negligible. For the liquid-vapor and solid-vapor regions, values are listed at selected temperatures for the bordering condensed phase and vapor boundaries and for selected values of pressure within the regions. Two sets of tables are included for each of these regions. In one set, the values of volume, enthalpy, and entropy are expressed for one pound of phase. In the second set, the values are expressed for one pound of two-phase mixture and a total composition of 50 percent by weight of UDMH. For the vapor region, property values are listed for selected temperatures along the dew point curve, and for temperatures in the superheat region. The nomenclature and units for the properties used in the Tables are defined in Table D-1.

TABLE D-1

NOMENCLATURE

$H^{(1)}$	- total enthalpy, Btu/lb A-50
HL	- enthalpy of liquid phase, Btu/lb of liquid
HS	- enthalpy of solid phase, Btu/lb of solid
HV	- enthalpy of vapor phase, Btu/lb of vapor
L	- liquid mass, lb of liquid/lb A-50
$S^{(1)}$	- total entropy, Btu/ $^{\circ}$ F-(lb A-50)
SL	- entropy of liquid phase, Btu/ $^{\circ}$ F - lb of liquid
SS	- entropy of solid phase, Btu/ $^{\circ}$ F - lb of solid
SV	- entropy of vapor phase, Btu/ $^{\circ}$ F - lb of vapor
$V^{(1)}$	- total volume, cu. ft./lb A-50
VL	- volume of liquid phase, cu.ft./lb of liquid
VS	- volume of solid phase, c.ft./lb of solid
VV	- volume of vapor phase, cu. ft./lb of vapor
WV	- vapor mass, lb vapor/lb A-50
X	- mass fraction UDMH in liquid phase, lb UDMH/lb liquid
Y	- mass fraction UDMH in vapor phase, lb UDMH/lb vapor.

(1) For the table for the liquid region only V, H and S for the equilibrium vapor phase are expressed per pound of vapor.

SOLID REGION

TEMP	VAPOR COMP	PRESSURE	VAPOR VOLUME	ENTHALPY		ENTROPY	
				SOLID	VAPOR	SOLID	VAPOR
-170.00	0.9993	0.00000088	58914720.	-168.7	9.66	0.264	1.574
-165.00	0.9993	0.00000168	31306944.	-168.2	10.00	0.271	1.556
-160.00	0.9992	0.00000315	16995824.	-167.8	10.35	0.278	1.539
-155.00	0.9992	0.00000578	9416031.	-167.3	10.70	0.284	1.523
-150.00	0.9991	0.00001040	5318440.	-166.8	11.05	0.290	1.507
-145.00	0.9990	0.00001638	3059831.	-166.3	11.42	0.297	1.492
-140.00	0.9990	0.00003189	1791542.	-165.7	11.78	0.303	1.478
-135.00	0.9989	0.00005440	1066640.	-165.2	12.16	0.309	1.464
-130.00	0.9988	0.00009132	645272.	-164.7	12.53	0.315	1.450
-125.00	0.9987	0.00015094	396351.	-164.2	12.92	0.321	1.437
-120.00	0.9987	0.00024581	247029.	-163.6	13.31	0.327	1.425
-115.00	0.9986	0.00039469	15e119.	-163.1	13.70	0.333	1.413
-110.00	0.9985	0.00062524	99990.	-162.6	14.10	0.338	1.402
-105.00	0.9984	0.00097768	64863.	-162.0	14.50	0.344	1.391
-100.00	0.9983	0.00150994	42594.	-161.4	14.91	0.350	1.380
-95.00	0.9983	0.00230438	28300.	-160.9	15.33	0.356	1.370
-90.00	0.9982	0.00347680	19015.	-160.3	15.75	0.361	1.360
-85.00	0.9981	0.00518849	12916.	-159.7	16.18	0.367	1.350
-80.00	0.9980	0.00766184	8864.	-159.1	16.61	0.372	1.341
-74.49	0.9979	0.01163789	5921.	-158.5	17.09	0.378	1.331

SOLID-LIQUID REGION

TEMP	PRESS	LIQUID COMP	VAPOR COMP	SOLID	VOLUME	LIQUID	VAPOR	SOLID	ENTHALPY	LIQUID	VAPOR	SOLID	ENTROPY
-74.5	0.01208	0.9671	0.9940	0.0140	0.0182	5723.3	-220.8	-77.0	17.1	0.313	0.564	1.336	
-70.0	0.01498	0.9591	0.9929	0.0140	0.0182	4674.9	-220.3	-76.9	17.5	0.317	0.573	1.333	
-65.0	0.01890	0.9493	0.9915	0.0140	0.0183	3756.0	-219.7	-76.8	18.0	0.323	0.583	1.331	
-60.0	0.02370	0.9387	0.9902	0.0140	0.0183	3036.5	-219.0	-76.8	18.4	0.330	0.592	1.328	
-55.0	0.02956	0.9280	0.9888	0.0140	0.0183	2468.0	-218.4	-76.9	18.9	0.338	0.602	1.326	
-50.0	0.03663	0.9158	0.9874	0.0140	0.0183	2018.7	-217.8	-77.0	19.4	0.347	0.611	1.324	
-45.0	0.04519	0.9040	0.9861	0.0140	0.0183	1658.5	-217.1	-77.1	19.9	0.356	0.620	1.321	
-40.0	0.05548	0.8926	0.9848	0.0140	0.0184	1368.6	-216.5	-77.2	20.3	0.366	0.629	1.319	
-35.0	0.06760	0.8771	0.9833	0.0140	0.0184	1138.1	-215.8	-77.7	20.8	0.375	0.638	1.318	
-30.0	0.08214	0.8639	0.9819	0.0140	0.0184	943.9	-215.1	-78.0	21.3	0.385	0.647	1.316	
-25.0	0.09918	0.8477	0.9803	0.0140	0.0184	796.0	-214.5	-78.5	21.8	0.394	0.656	1.315	
-20.0	0.11920	0.8303	0.9787	0.0140	0.0184	670.9	-213.8	-79.1	22.3	0.404	0.665	1.314	
-15.0	0.14272	0.8132	0.9771	0.0140	0.0184	567.5	-213.1	-79.8	22.8	0.414	0.673	1.313	
-10.0	0.16984	0.7912	0.9753	0.0140	0.0183	483.0	-212.4	-80.9	23.3	0.423	0.681	1.312	
-5.0	0.20136	0.7684	0.9734	0.0140	0.0183	412.5	-211.7	-82.0	23.9	0.432	0.690	1.312	
-0.0	0.23762	0.7417	0.9715	0.0140	0.0182	354.0	-211.1	-83.6	24.4	0.442	0.698	1.312	
5.0	0.27940	0.7130	0.9695	0.0140	0.0182	304.9	-210.3	-85.3	24.9	0.451	0.705	1.311	
10.0	0.32709	0.6780	0.9674	0.0140	0.0181	263.7	-209.6	-87.7	25.5	0.460	0.713	1.312	
15.0	0.38118	0.6310	0.9652	0.0140	0.0180	229.1	-208.9	-91.3	26.0	0.469	0.720	1.312	
20.0	0.44254	0.5657	0.9629	0.0140	0.0178	199.8	-208.2	-96.8	26.6	0.478	0.725	1.312	
23.6	0.49155	0.5001	0.9611	0.0140	0.0176	181.5	-207.7	-102.6	27.0	0.485	0.728	1.313	

S-V,L-V BOUNDARY

TEMP	PRESS	LIQUID COMP	VAPOR COMP	SOLID	VOLUME	LIQUID	VAPOR	SOLID	ENTHALPY	LIQUID	SOLID	ENTROPY	VAPOR
23.61	0.4915	0.4999	0.9611	0.0140	0.0176	181.5	-207.6	-102.6	26.958	0.485	0.728	1.313	
24.00	0.4969	0.4890	0.9609	0.0140	0.0175	179.7	-207.6	-103.6	27.002	0.486	0.728	1.313	
26.00	0.5245	0.4336	0.9597	0.0140	0.0173	171.2	-207.3	-108.9	27.226	0.489	0.728	1.313	
28.00	0.5492	0.3718	0.9581	0.0140	0.0171	164.4	-207.0	-114.9	27.456	0.493	0.727	1.315	
30.00	0.5607	0.2929	0.9550	0.0140	0.0168	162.1	-206.7	-122.7	27.699	0.496	0.726	1.318	
32.00	0.5375	0.2066	0.9479	0.0140	0.0164	170.8	-206.4	-131.5	27.978	0.498	0.726	1.327	
34.00	0.4165	0.1069	0.9233	0.0140	0.0161	225.8	-206.1	-141.9	28.413	0.500	0.736	1.357	
34.20	0.2807	0.0557	0.8784	0.0140	0.0158	347.5	-206.1	-147.5	28.833	0.499	0.754	1.406	
34.30	0.1862	0.0290	0.8024	0.0140	0.0157	555.5	-206.1	-150.5	29.517	0.498	0.775	1.480	
34.35	0.1285	0.0150	0.6860	0.0140	0.0157	875.2	-206.1	-152.0	30.555	0.498	0.796	1.582	
34.38	0.0932	0.0078	0.5000	0.0140	0.0156	1360.9	-206.1	-153.0	32.200	0.497	0.820	1.731	

SOLID-VAPOR REGION (TEMPERATURES BELOW QP)

S-V- BOUNDARY PRESSURE*		S-S-V BOUNDARY PRESSURE*		PRESSURE:PSIA**		S-V- BOUNDARY PRESSURE*	
TEMP	PSIA	PSIA	PSIA	PSIA	PSIA	PSIA	PSIA
-100.00	1.5100	V	0.9983	0.9983	0.9950	0.9873	0.9338
	V5	0.014		0.00429	0.01290	0.03247	0.07314
	VV*	0.00426					0.16985
	HS	-223.86					0.36059
	HV	14.92					1.28238
	SS	0.347					VV
	SV	1.381					19.05
							HY
-95.00	2.3043	V	0.9983	0.9973	0.9919	0.9796	0.9536
	V5	0.014		0.00435	0.01311	0.03314	0.07529
	VV*	0.00283					0.17845
	HS	-223.27					0.39492
	HV	15.33					0.81047
	SS	0.354					VV
	SV	1.371					19.48
							HV
-90.00	3.4760	V	0.9982	0.9979	0.9957	0.9871	0.9672
	V5	0.014		0.00220	0.00442	0.01335	0.03395
	VV*	0.00190					0.19172
	HS	-222.67					0.45749
	HV	15.75					0.51787
	SS	0.360					VV
	SV	1.361					19.92
							HV
-85.00	5.1886	V	0.9981	0.9967	0.9933	0.9797	0.9478
	V5	0.014		0.00224	0.00449	0.01362	0.03498
	VV*	0.00129					0.08232
	HS	-222.07					0.21394
	HV	16.18					0.33495
	SS	0.366					VV
	SV	1.352					20.37
							HV
-80.00	7.6619	V	0.9980	0.9948	0.9896	0.9682	0.9171
	V5	0.014		0.00227	0.00456	0.01394	0.03635
	VV*	0.00089					0.08864
	HS	-221.47					0.21918
	HV	16.61					VV
	SS	0.372					20.81
	SV	1.343					HV

* * TIMES 101 - 71

SOLID-VAPOR REACTION (TEMPERATURES FROM QP TO PTP1)

S-L,S-V BOUNDARY PRESSURE*	S-L,S-V BOUNDARY PRESSURE*	PRESSURE: PSIAT#	PRESSURE: PSIAT#	BOUNDARY PRESSURE*	S-V,V BOUNDARY PRESSURE*				
-74.49 1.2080 V 0.9940	V5 0.014 VV* 0.00572 HS -220.79 HW 17.12 SS 0.379 SV 1.356	0.9965 0.00986 17.10 1.351	1.9917 0.02309 17.14 1.385	0.9833 0.04652 17.21 1.417	0.9248 0.10138 17.71 1.463	0.8077 0.20963 18.70 1.526	0.1150 0.0350 21.31 1.672	0.500 1.39218 21.31 1.992	0.00710 VV HV SV
-70.00 1.4977 V 0.9929	V5 0.014 VV* 0.00467 HS -220.24 HW 17.92 SS 0.385 SV 1.333	0.9949 0.00998 17.51 1.356	0.9879 0.02344 17.57 1.392	0.9756 0.04737 17.67 1.428	0.9465 0.10405 17.42 1.484	0.8877 0.21832 20.03 1.566	0.6984 0.58619 20.03 1.779	0.500 0.97154 21.72 1.978	0.01029 VV HV SV
-6 -6 1.8902 V 0.9915	V5 0.014 VV* 0.00376 HS -219.61 HW 17.98 SS 0.391 SV 1.331	0.9964 0.00471 17.94 1.363	0.9923 0.01014 17.97 1.402	0.9616 0.02386 18.06 1.440	0.9179 0.04850 18.22 1.516	0.8230 0.23251 18.11 1.632	0.500 0.10790 19.42 1.735	0.500 0.65664 22.18 1.963	0.01542 VV HV SV
-60.00 1.3705 V 0.9902	V5 0.014 VV* 0.00304 HS -218.99 HW 18.44 SS 0.397 SV 1.328	0.9907 0.00478 18.40 1.363	0.9901 0.01030 18.46 1.415	0.9726 0.02435 18.59 1.467	0.9444 0.04989 18.80 1.562	0.8734 0.11320 19.44 1.735	0.500 0.10762 20.80 1.948	0.500 0.65664 22.65 1.948	0.02288 VV HV SV
-55.00 2.9562 V 0.9885	V5 0.014 VV* 0.00247 HS -218.35 HW 18.91 SS 0.402 SV 1.326	0.9907 0.00478 18.88 1.370	0.9922 0.01048 18.96 1.415	0.9830 0.02694 19.16 1.467	0.9597 0.05170 19.53 1.562	0.8040 0.12088 20.50 1.630	0.500 0.11320 22.88 1.907	0.500 0.65664 23.12 1.912	0.03342 VV HV SV

* TIMES 10¹ - 61

SOLID-VAPOR REGION TEMPERATURES FROM QP TO PTP11

S-L-S-V BOUNDARY PRESSURE*		S-L-S-V BOUNDARY PRESSURE*		PRESSURE: PSIA**		PRESSURE: PSIA**		S-V-V BOUNDARY PRESSURE*		
TEMP	PRESSURE*	TEMP	PRESSURE*	4.5000	2.5000	1.2000	0.7000	0.3000	0.1500	0.0900
-50.00	3.6634	V	0.9874	0.9932	0.9856	0.9752	0.9403	0.8741	0.7735	0.500
	VV*	0.02019	VS 0.014	0.02946	0.01677	0.10677	0.25656	0.56138	0.97380	0.04892
	HS -217.71	HV 19.38	SS 0.408	19.33	19.40	19.49	19.79	20.36	21.23	23.59
	SV 1.324	S 0.414	SV 1.321	1.363	1.331	1.337	1.454	1.541	1.652	1.919
-45.00	4.5106	V	0.9881	0.9945	0.9901	0.9792	0.9639	0.9120	0.8094	0.6425
	VV*	0.01658	VS 0.014	0.01653	0.02987	0.06282	0.10911	0.26579	0.57590	1.07987
	HS -217.07	HV 19.86	SS 0.414	19.79	19.82	19.92	20.05	20.50	21.39	22.84
	S 0.414	SV 1.321	SV 1.313	1.337	1.373	1.406	1.484	1.603	1.772	1.908
-40.00	5.5480	Y	0.9848	0.9922	0.9858	0.9700	0.9476	0.8699	0.7060	0.500
	VV*	0.01369	VS 0.014	0.01677	0.03035	0.06408	0.11195	0.27820	0.62784	1.06890
	HS -216.42	HV 20.34	SS 0.420	20.28	20.33	20.47	20.66	21.34	22.76	24.53
	S 0.426	SV 1.319	SV 1.319	1.345	1.365	1.425	1.526	1.698	1.892	2.080
-35.00	6.7600	Y	0.9833	0.9889	0.9798	0.9570	0.9293	0.8063	0.5337	0.500
	VV*	0.01138	VS 0.014	0.01731	0.03087	0.06556	0.11549	0.29557	0.71167	0.76292
	HS -215.76	HV 20.83	SS 0.426	20.78	20.86	21.06	21.34	22.37	24.75	25.04
	S 0.431	SV 1.318	SV 1.326	1.355	1.401	1.450	1.587	1.849	2.080	2.253
-30.00	8.2136	Y	0.9819	0.9843	0.9714	0.9387	0.8906	0.7075	0.500	0.20088
	VV*	0.00949	VS 0.014	0.01728	0.03146	0.06736	0.12008	0.32115	0.54990	0.54990
	HS -215.10	HV 21.32	SS 0.431	21.30	21.41	21.70	22.12	23.72	25.53	25.53
	S 0.436	SV 1.316	SV 1.334	1.366	1.422	1.484	1.676	1.867	2.067	2.253

* TIMES 10^{1 - 51}** TIMES 10^{1 - 21}

SOLID-VAPOR REGION (TEMPERATURES FROM QP TO PTP1)

S-L-S-V BOUNDARY	S-L-S-V TEMP PRESS**	PRESSURE: PSIA**	0.2000	0.4000	0.2500	0.1200	0.0700	0.0450	S-V, V BOUNDARY	S-V, V PRESS**
-25.00 0.9918 Y 0.9803	VV* 0.07960	0.9859	0.9751	0.9597	0.9127	0.8416	0.7331	0.500	V 0.02799	
HS -21.43	HS 21.2	0.11224	0.19825	0.32139	0.69617	1.26230	2.12726	3.98433	VV	
SS 0.437	SV 1.355	21.77	21.87	22.00	22.41	23.03	23.96	26.02	HV	
		1.322	1.351	1.381	1.449	1.531	1.641	1.855	SV	
-20.00 1.1920 Y 0.9787	VV* 0.06709	0.9804	0.9653	0.9434	0.8754	0.7684	0.5640	0.500	V 0.03877	
HS -213.76	HS 22.32	0.11407	0.20222	0.32957	0.72550	1.34871	2.36407	2.91034	VV	
SS 0.442	SV 1.314	22.31	22.44	22.63	23.23	24.17	25.70	26.52	HV	
		1.330	1.363	1.399	1.485	1.597	1.760	1.843	SV	
-15.00 1.4272 Y 0.9771	VV* 0.05675	0.9843	0.9729	0.9517	0.9207	0.8214	0.6554	0.500	V 0.05329	
HS -213.08	HS 22.09	0.06707	0.11612	0.20688	0.33962	0.76500	1.47610	2.14120	VV	
SS 0.448	SV 1.313	22.77	22.87	23.06	23.33	24.20	25.66	27.03	HV	
		1.312	1.341	1.379	1.423	1.535	1.695	1.832	SV	
-10.00 1.6984 Y 0.9753	VV* 0.04830	0.9785	0.9627	0.9330	0.8890	0.7415	0.500	V 0.07274		
HS -212.99	HS 23.35	0.06817	0.11845	0.21248	0.35235	0.82037	1.58631	VV		
SS 0.453	SV 1.312	23.32	23.46	23.72	24.11	25.41	27.53	HV		
		1.321	1.354	1.399	1.454	1.605	1.821	1.921	SV	
-5.00 2.0136 Y 0.9734	VV* 0.04129	0.9707	0.9488	0.9073	0.8441	0.6189	0.500	V 0.09861		
HS -211.70	HS 23.87	0.06939	0.12117	0.21942	0.36902	0.90203	1.19116	VV		
SS 0.459	SV 1.312	23.90	24.09	24.45	25.01	27.00	28.04	HV		
		1.332	1.370	1.425	1.496	1.708	1.810	1.810	SV	

 * TIMES 10⁽⁻⁴⁾
 ** TIMES 10⁽⁻¹⁾

SOLID-VAPOR REGION TEMPERATURES FROM QP TO PTP11

		S-L, S-V BOUNDARY PRESS**		PRESSURE: PSIA**		S-V, V BOUNDARY PRESS**			
TEMP	PRESS**	S-L, S-V BOUNDARY	3.0000	2.0000	1.2000	0.7000	0.5000	0.3500	0.2000
0.0	2.3762	Y	0.9715	0.9765	0.9602	0.9300	0.8996	0.8510	0.7110
	V5 0.014	VV* 0.35402	HS -211.01	0.41883	0.70777	1.24424	1.78563	2.65064	5.10113
	HW 24.40		SS 0.464	24.35	24.50	24.76	25.03	25.46	26.70
	SV 1.312			1.313	1.345	1.389	1.427	1.481	1.616
5.00	2.7940	Y	0.9695	0.9683	0.9461	0.9044	0.8616	0.7914	0.3171
	V5 0.014	VV* 0.30487	HS -210.31	0.42636	0.72399	1.23435	1.86029	2.8301	5.48262
	HW 24.93		SS 0.470	24.94	25.14	25.50	25.88	26.50	28.40
	SV 1.311			1.324	1.361	1.415	1.462	1.533	1.725
10.00	3.2709	Y	0.9674	0.9720	0.9570	0.9272	0.8693	0.8082	0.7048
	V5 0.014	VV* 0.26364	HS -209.60	0.28640	0.43493	0.74334	1.33499	1.95855	3.01061
	HW 25.47		SS 0.475	25.43	25.55	25.82	26.33	26.87	27.79
	SV 1.312			1.311	1.337	1.380	1.447	1.509	1.605
15.00	3.8117	Y	0.9652	0.9626	0.9430	0.9018	0.8206	0.7320	0.5745
	V5 0.014	VV* 0.22912	HS -208.89	0.29179	0.44490	0.76697	1.40076	2.09237	3.32283
	HW 26.01		SS 0.480	26.03	26.21	26.57	27.29	28.07	29.47
	SV 1.312			1.322	1.353	1.405	1.490	1.573	1.709
20.00	4.4254	Y	0.9629	0.9504	0.9240	0.8675	0.7523	0.6201	0.500
	V5 0.014	VV* 0.19981	HS -208.17	0.29786	0.45669	0.79644	1.48856	2.28168	3.00410
	HW 26.56		SS 0.485	26.67	26.90	27.40	28.42	29.59	30.66
	SV 1.312			1.336	1.372	1.436	1.547	1.662	1.760

* TIMES 10⁻³
** TIMES 10⁻¹¹

SOLID-VAPOR REGION (TEMPERATURES BETWEEN PTP1 AND PTP2)

TEMP	PRESSURE	L-V, S-V BOUNDARY	L-V, S-V BOUNDARY	PRESSURE: PSIA**	3.0000	2.0000	1.2000	0.8000	0.6000	S-V, V BOUNDARY	S-V, V BOUNDARY
23.60	4.9160	Y VS 0.014 VV* 0.18190 HS -207.65 HV 26.96 SS 0.489 SV 1.313	Y VS 0.014 VV* 0.17117 HS -207.30 HV 27.23 SS 0.492 SV 1.313	0.9551 0.22420 27.01 1.325	0.9393 0.30289 27.15 1.348	0.9065 0.46673 27.44 1.389	0.8352 0.82273 28.07 1.064	0.7336 1.32994 28.97 1.559	0.6148 1.92258 30.02 1.660	0.500 2.09519 31.00 1.754	0.49700 VV HV SV
26.00	5.2449	Y VS 0.014 VV* 0.17247 HS -207.30 HV 27.23 SS 0.492 SV 1.313	Y VS 0.014 VV* 0.17247 HS -207.30 HV 27.23 SS 0.492 SV 1.313	0.9597 0.22653 27.22 1.313	0.9609 0.22653 27.32 1.332	0.9305 0.30662 27.49 1.357	0.8926 0.47434 27.62 1.402	0.8090 0.84340 28.56 1.486	0.6873 1.38041 29.64 1.595	0.5413 2.02514 30.94 1.717	0.500 2.02690 31.30 1.749
30.00	5.6070	Y VS 0.014 VV* 0.16208 HS -206.72 HV 27.70 SS 0.496 SV 1.316	Y VS 0.014 VV* 0.16208 HS -206.72 HV 27.73 SS 0.496 SV 1.323	0.9550 0.17526 27.70 1.316	0.9515 0.23080 27.87 1.345	0.9361 0.31357 28.07 1.374	0.8646 0.48892 28.50 1.427	0.7551 0.8866 29.47 1.530	0.5886 1.48619 30.95 1.672	0.500 1.80957 31.73 1.742	0.69593 VV HV SV
34.00	4.1650	Y VS 0.014 VV* 0.22583 HS -206.13 HV 28.41 SS 0.500 SV 1.357	Y VS 0.014 VV* 0.22583 HS -206.13 HV 28.41 SS 0.500 SV 1.480	0.9233 0.23569 28.44 1.360	0.9205 0.32170 28.69 1.394	0.8915 0.50659 29.25 1.457	0.8291 0.93773 30.54 1.587	0.6837 0.93773 30.95 1.672	0.500 1.48213 32.16 1.735	0.85472 VV HV SV	
36.30	1.8620	Y VS 0.014 VV* 0.55555 HS -206.08 HV 29.52 SS 0.500 SV 1.480	Y VS 0.014 VV* 0.55555 HS -206.08 HV 29.52 SS 0.500 SV 1.480	0.8024 0.23569 28.44 1.360	0.8024 0.32170 28.69 1.394	0.6774 0.50659 29.25 1.457	0.6837 0.93773 30.54 1.587	0.500 0.94241 30.63 1.592	0.500 1.46007 32.20 1.735	0.86816 VV HV SV	

* TIMES 10⁴ - 31
** TIMES 10⁴ 11

SOLID-VAPOR REGION (TEMPERATURES BELOW QP) (FOR ONE POUND OF A-50)

TEMP	S, S-V		S, S-V		S-V, V	
	BOUNDARY PRESSURE**	BOUNDRY	PRESSURE:PSIA**	PSIA**	BOUNDRY	PRESSURE**
-100.00	1.5100	Y 0.9983 V* 0.00213	0.9983 0.00215	0.5000 0.00648	0.0900 0.01644	0.0400 0.03764
	H-104.27	-104.27	-103.85	-102.90	-100.85	-95.72
	S 0.865	0.865	0.887	0.911	0.943	-84.28
	MV 0.5008	0.5008	0.5025	0.5064	0.5147	16.98
					0.5355	1.121
					0.5618	2.061
					0.9997	5
						HV
-95.00	2.3043	Y 0.9983 V* 0.00142	0.9973 0.00216	0.9919 0.00661	0.9796 0.01691	0.9536 0.03946
	H-103.76	-103.65	-102.97	-101.40	-97.97	-88.71
	S 0.863	0.871	0.896	0.925	0.970	-64.22
	MV 0.5009	0.5013	0.5041	0.5104	0.5243	1.301
					0.5618	2.062
					0.6610	5
					0.9997	HV
-90.00	3.4768	Y 0.9982 V* 0.00095	0.9979 0.00110	0.9951 0.00222	0.9671 0.00676	0.9245 0.01755
	H-103.24	-103.21	-102.94	-101.86	-99.29	-93.40
	S 0.861	0.864	0.876	0.906	0.944	-75.45
	MV 0.5009	0.5011	0.5021	0.5065	0.5169	-5.89
					0.5408	19.86
					0.6135	H
					0.8954	2.044
					0.9997	S
						HV
-85.00	5.1886	Y 0.9981 V* 0.00065	0.9967 0.00112	0.9933 0.00226	0.9797 0.00695	0.9476 0.01645
	H-102.72	-102.54	-102.13	-100.40	-96.17	-85.69
	S 0.860	0.870	0.886	0.919	0.972	-45.11
	MV 0.5010	0.5017	0.5034	0.5104	0.5275	1.078
					0.5700	1.449
					0.7345	2.027
					0.9997	S
						HV
-80.00	7.6619	Y 0.9980 V* 0.00044	0.9948 0.00114	0.9896 0.00230	0.9682 0.00720	0.9171 0.01982
	H-102.19	-101.80	-101.14	-98.39	-91.30	-71.21
	S 0.859	0.877	0.895	0.937	1.014	20.75
	MV 0.5010	0.5026	0.5053	0.5164	0.5452	2.010
					0.6267	S
					0.9997	HV

* TIMES 10^4 -7
** TIMES 10^4 -3

NOMENCLATURE: Y= WEIGHT FRACTION UDMH IN VAPOR
H= TOTAL ENTHALPY, BTU/LB A-50
S= TOTAL ENTROPY , BTU/LB A-50, DEG F
MV=LBS VAPOR / LB A-50

V= TOTAL VOLUME, CU.FT./LB A-50
S= TOTAL ENTROPY , BTU/LB A-50

SOLID-VAPOR REGION TEMPERATURES FROM QP 10 PT11 (FOR ONE POUND OF A-50)

	S-L, S-V BOUNDARY PRESSURE*	S-L-S-V BOUNDARY PRESSURE**	PRESSURE: PSIA*** 1.5000 0.7000	0.3000	0.1500	0.0700	0.0350	0.0150	S-V, V BOUNDARY PRESSURE
-74.49	1.2080	Y 0.9940 Y* 0.00286	0.9965 0.00495 -101.42 0.867 0.5018	0.9917 0.01164 -100.83 0.886 0.5042	0.9833 0.02366 -99.77 0.907 0.5085	0.9636 0.05260 -97.21 0.941 0.5189	0.9248 0.11323 -91.85 0.999 0.5407	0.8077 0.33159 -72.53 1.180 0.6191	0.500 1.39180 21.25 1.992 0.9997
-70.00	1.4977	Y 0.9929 Y* 0.00235	0.9949 0.00502 -100.75 0.873 0.5026	0.9879 0.01186 -99.89 0.894 0.5061	0.9756 0.02428 -98.31 0.919 0.5125	0.9465 0.05497 -94.42 0.965 0.5283	0.8877 0.12297 -85.81 1.050 0.5633	0.6984 0.41966 -48.23 1.383 0.7159	0.500 0.97132 21.66 1.978 0.9997
-65.00	1.8902	Y 0.9915 Y* 0.00189	0.9964 0.00236 -100.41 0.864 0.5018	0.9923 0.00511 -99.90 0.880 0.5039	0.9818 0.01215 -98.58 0.906 0.5093	0.9631 0.02518 -96.14 0.936 0.5192	0.9179 0.05878 -89.84 1.003 0.5447	0.8230 0.14126 -74.39 1.145 0.6075	0.500 0.65647 22.12 1.962 0.9997
-60.00	2.3705	Y 0.9902 Y* 0.00153	0.9947 0.00240 -99.65 0.870 0.5027	0.9885 0.00521 -98.89 0.889 0.5058	0.9728 0.01252 -96.88 0.920 0.5140	0.9444 0.06462 -93.07 0.963 0.5295	0.8738 0.06478 -82.55 1.063 0.5722	0.7162 0.17769 -51.58 1.331 0.6982	0.500 0.44812 22.59 1.947 0.9997
-55.00	2.9562	Y 0.9888 Y* 0.00125	0.9922 0.00244 -98.80 0.877 0.5040	0.9830 0.00533 -97.65 0.899 0.5086	0.9597 0.01299 -94.60 0.939 0.5210	0.9164 0.02821 -88.55 0.939 0.5456	0.8044 0.07514 -69.89 1.000 0.6216	0.5281 0.27615 10.05 1.165 0.9468	0.500 0.30844 23.06 1.933 0.9997

* TIMES 10¹ -6!
** TIMES 10¹ -2!

NOMENCLATURE: Y= WEIGHT FRACTION UDMH IN VAPOR
 H= TOTAL ENTHALPY, BTU/LB A-50
 S= TOTAL ENTROPY, BTU/(LB A-50, DEG F)
 MV=LB VAPOR / LB A-50

V= TOTAL VOLUME, CU.FT./LB A-50
 S= TOTAL ENTROPY, BTU/(LB A-50, DEG F)

SOLID-VAPOR REGION (TEMPERATURES FROM QP TO PTPL) (FOR ONE POUND OF A-50)

TEMP	S-L S-V BOUNDARY PRESS**	S-L S-V BOUNDARY	PRESSURE: PSIA** 4.0000 2.5000	0.7000	0.3000	0.1500	0.0900	S-V, V BOUNDARY
-50.00	3.6634	V 0.9874 V* 0.01022 H -97.66 S 0.872 WV 0.5064	0.9932 0.01482 -96.37 0.873 0.5034	0.9856 0.03131 -97.43 0.892 0.5073	0.9752 0.05475 -96.09 0.912 0.5127	0.9403 0.13642 -91.42 0.964 0.5317	0.8741 0.30969 -81.52 1.056 0.5720	0.7735 0.62950 -63.25 1.212 0.6464
-45.00	4.5186	V 0.9861 V* 0.00841 H -96.94 S 0.874 WV 0.5070	0.9945 0.00831 -97.99 0.866 0.5028	0.9901 0.01509 -97.44 0.880 0.5050	0.9792 0.03208 -96.06 0.904 0.5106	0.9639 0.05660 -94.07 0.929 0.5187	0.9120 0.14572 -86.82 1.001 0.5482	0.8094 0.35578 -69.76 1.149 0.6178
-40.00	5.5480	V 0.9848 V* 0.00695 H -96.21 S 0.877 WV 0.5077	0.9922 0.00845 -97.13 0.873 0.5040	0.9858 0.01539 -96.34 0.889 0.5072	0.9700 0.03303 -94.31 0.917 0.5154	0.9476 0.05907 -91.33 0.950 0.5276	0.8699 0.15990 -79.76 1.056 0.5748	0.7064 0.44440 -67.12 1.125 0.7078
-35.00	6.7600	V 0.9833 V* 0.00579 H -95.45 S 0.879 WV 0.5085	0.9889 0.00860 -96.16 0.881 0.5056	0.9798 0.01575 -95.01 0.900 0.5103	0.9570 0.03425 -92.04 0.935 0.5224	0.9243 0.06247 -87.50 0.980 0.5409	0.8063 0.18328 -68.10 1.146 0.6201	0.5337 0.66671 9.55 1.759 0.9368
-30.00	8.2136	V 0.9819 V* 0.00483 H -94.70 S 0.882 WV 0.5092	0.9843 0.00876 -95.01 0.890 0.5080	0.9714 0.01619 -93.35 0.913 0.5147	0.9387 0.03588 -88.96 0.959 0.5327	0.8906 0.06741 -81.93 1.022 0.5614	0.7075 0.22695 -46.33 1.311 0.7067	0.500 0.24866 25.47 1.867 0.9997

* TIMES 10¹ (-5)
** TIMES 10¹ (-2)

NOMENCLATURE: V= WEIGHT FRACTION UDMH IN VAPOR
 H= TOTAL ENTHALPY, BTU/LB A-50
 S= TOTAL ENTROPY, BTU/ILB A-50. DEG R
 WV=LB VAPOR / LB A-50

SOLID-VAPOR REGION (TEMPERATURES FROM QP TO PTPL) (FOR ONE POUND OF A-50)

TEMP	S-L,S-V BOUNDARY PRESS**	S-L,S-V BOUNDARY	PRESSURE: PSIA** 1.2000 0.7000	0.4000	0.2500	0.1200	0.0700	0.0450	S-V,V BOUNDARY	S-V,V BOUNDARY PRESS**	
-25.00	0.9918 Y* 0.04060 H -93.93 S 0.885 WV 0.5100	0.9803	0.9859 0.05692 -94.64 0.885 0.5071	0.9751 0.10165 -93.27 0.905 0.5128	0.9597 0.16745 -91.25 0.929 0.5210	0.9127 0.38139 -84.68 0.991 0.5478	0.8416 0.74991 -73.36 1.087 0.5941	0.7331 1.45083 -51.83 1.258 0.6820	0.500 3.98326 25.96 1.855 0.9997	Y 0.02799 Y H S WV	
		-19.20	0.9787 Y* 0.03620 H -93.15 S 0.888 WV 0.5109	0.9804 0.05610 -93.36 0.895 0.5100	0.9653 0.10475 -91.41 0.919 0.5180	0.9434 0.17467 -88.47 0.949 0.5300	0.8754 0.41439 -78.40 1.038 0.5712	0.7684 0.87766 -58.93 1.194 0.6507	0.5940 1.99010 -12.18 1.1552 0.8418	0.500 2.90956 26.46 1.843 0.9997	Y 0.03877 Y H S WV
		-14.272	0.9771 Y* 0.02904 H -92.36 S 0.891 WV 0.5117	0.9843 0.03407 -93.28 0.887 0.5030	0.9729 0.05968 -91.82 0.907 0.5139	0.9517 0.10869 -89.02 0.937 0.5254	0.9207 0.18443 -84.70 0.977 0.5431	0.8214 0.46566 -68.64 1.110 0.6087	0.6554 1.12611 -30.95 1.399 0.7629	0.500 2.14062 26.96 1.831 0.9997	Y 0.05329 Y H S WV
		-10.00	0.9753 Y* 0.02476 H -91.53 S 0.894 WV 0.5127	0.9753 0.02476 -91.95 0.897 0.5110	0.9627 0.06152 -89.49 0.921 0.5194	0.9330 0.11387 -85.86 0.960 0.5359	0.8890 0.19918 -79.37 1.016 0.5624	0.7415 0.55319 -52.04 1.230 0.6743	0.500 1.58589 27.47 1.820 0.9997	Y 0.07274 Y H S WV	
D-15	-5.00 2.0136 Y* 0.02119 H -90.70 S 0.897 WV 0.5136	0.9734 0.03574 -90.35 0.909 0.5151	0.9707 0.06386 -87.45 0.939 0.5270	0.9488 0.12092 -81.56 0.991 0.5511	0.9073 0.21092 -81.56 0.991 0.5924	0.8441 0.21859 -71.48 1.073 0.8079	0.6189 0.72873 -18.86 1.468 0.8079	0.500 1.18284 27.98 1.810 0.9997	Y 0.09861 Y H S WV		
		* TIMES 10 ⁴	** TIMES 10 ⁴								

NOMENCLATURE: Y= WEIGHT FRACTION UDMH IN VAPOR
 H= TOTAL ENTHALPY, BTU/LB A-50
 WV=LB VAPOR / LB A-50

V= TOTAL VOLUME, CU.FT./LB A-50
 S= TOTAL ENTROPY , BTU/ILB A-50, DEG F

SOLID-VAPOR REGION (TEMPERATURES FROM QP TO PTPI) (FOR ONE POUND OF A-50)

	S-L, S-V BOUNDARY PRESS**	S-L, S-V BOUNDARY	PRESSURE: PSIA**						S-V, V BOUNDARY PRESS**
0.0	2.3762	Y 0.9715 V* 0.18221 H -89.85 S 0.900 WV 0.5147	0.9765 0.21447 -90.49 0.899 0.900 0.5121	0.9602 0.36855 -88.38 0.923 0.5207	0.9300 0.66892 -84.26 0.962 0.5376	0.9996 0.99245 -79.82 0.999 0.5558	0.4510 1.55740 -72.07 1.062 0.5876	0.7110 3.61559 -63.84 1.274 0.7033	0.500 8.88890 28.49 1.799 0.9997
5.00	2.7940	Y 0.9695 V* 0.15723 H -88.99 S 0.904 WV 0.5157	0.9683 0.22017 -88.83 0.911 0.5164	0.9461 0.38261 -85.88 0.940 0.5285	0.9044 0.71005 -79.94 0.992 0.5528	0.8616 1.07961 -73.24 1.046 0.5803	0.7914 1.77092 -60.69 1.141 0.6318	0.5771 4.92367 -3.49 1.5557 0.86664	0.500 6.71510 29.01 1.769 0.9997
10.00	3.2709	Y 0.9674 V* 0.13629 H -88.11 S 0.907 WV 0.5168	0.972C 0.14734 -88.70 0.905 0.5144	0.9574 0.2271 -86.79 0.925 0.5222	0.9272 0.40085 -82.65 0.963 0.5392	0.8693 0.76787 -73.89 1.034 0.5752	0.8082 1.21163 -63.31 1.115 0.6186	0.7048 2.13853 -41.20 1.277 0.7094	0.500 5.10385 29.54 1.779 0.9997
15.00	3.8117	Y 0.9652 V* 0.11870 H -87.20 S 0.911 WV 0.5180	0.9626 0.15154 -86.87 0.918 0.5194	0.9430 0.23589 -84.24 0.943 0.5302	0.9018 0.42526 -78.33 0.993 0.5545	0.8206 0.85349 -64.98 1.095 0.6093	0.7320 1.42214 -47.04 1.226 0.6830	0.500 3.90215 30.06 1.769 0.9997	
20.00	4.4254	Y 0.9629 V* 0.10376 H -86.28 S 0.915 WV 0.5193	0.9504 0.15670 -84.63 0.933 0.5261	0.9240 0.24713 -80.97 0.965 0.5411	0.8675 0.45906 -72.39 1.033 0.5764	0.7523 0.88933 -50.93 1.191 0.66446	0.6203 1.83906 -16.53 1.434 0.8060	0.500 3.00329 30.59 1.760 0.9997	

* TIMES 10⁻³
** TIMES 10⁻¹

NOMENCLATURE: Y= WEIGHT FRACTION UDMH IN VAPOR
H= TOTAL ENTHALPY, BTU/LB A-50
WV=LB VAPOR / LB A-50

V= TOTAL VOLUME, CU.FT./LB A-50
S= TOTAL ENTROPY, BTU/(LB A-50, DEG F)

SOLID-VAPOR REGION (TEMPERATURES BETWEEN PTP1 AND PTP2) (FOR ONE POUND OF A-50)

	L-V-S-V BOUNDARY TEMP PRESS**	L-V, S-V BOUNDARY	PRESSURE, PSIA**	3.0000	2.0000	1.2000	0.8000	0.6000	S-V, V BOUNDARY PRESS**
23.60	4.9160	Y 0.9611	0.9551	0.9393	0.9065	0.8352	0.7336	0.6148	0.500 Y 0.49700
V*	0.09443		0.11736	0.16124	0.25744	0.49255	0.90649	1.56347	V
H	-85.60		-84.80	-82.67	-77.98	-66.53	-46.37	-14.37	H 30.98
S	0.918		0.927	0.946	0.985	1.073	1.218	1.442	S 1.753
WV	0.5202		0.5235	0.5323	0.5516	0.5987	0.6816	0.8132	WV 0.9997
26.00	5.2449	Y 0.9597	0.9609	0.9487	0.9305	0.8926	0.8090	0.6873	0.5413 Y 0.56473
V*	0.08919		0.08975	0.11940	0.16476	0.26572	0.52129	1.00418	V 2.20630
H	-85.11		-85.27	-83.64	-81.15	-75.59	-61.52	-34.94	H 12.76 31.24
S	0.920		0.919	0.935	0.956	1.001	1.106	1.295	S 1.623 1.749
WV	0.5210		0.5203	0.5270	0.5373	0.5602	0.6181	0.7274	WV 0.9997
30.00	5.6070	Y 0.9550	0.9515	0.9361	0.9132	0.8646	0.7551	0.5886	0.500 Y 0.69593
V*	0.08487		0.09211	0.12328	0.17170	0.28273	0.58582	1.26257	V 1.80509
H	-83.98		-83.51	-81.42	-78.16	-70.70	-50.32	-4.81	H 31.67 1.742
S	0.926		0.931	0.949	0.976	1.034	1.181	1.495	S 0.9997
WV	0.5236		0.5255	0.5341	0.5475	0.5783	0.6622	0.8495	
34.00	4.1650	Y 0.9233		0.9205	0.8915	0.8291	0.6837	0.500 Y 0.85472	
V*	0.12230			0.12802	0.18043	0.30549	0.68573	1.48173	V
H	-79.12			-78.72	-74.43	-64.19	-33.06	32.10	H 1.735 0.9997
S	0.964			0.967	1.001	1.077	1.295		
WV	0.5415			0.5432	0.5609	0.6030	0.7313		
38.30	1.8620	Y 0.8024				0.6774	0.500 Y 0.86818		
V*	0.34617					0.69565	1.45968		
H	-59.28					-31.35	32.13		
S	1.111					1.306	1.735		
WV	0.6231					0.7382	0.9997		

* TIMES 10⁻³
** TIMES 10⁻¹

NOMENCLATURE: Y= WEIGHT FRACTION UDMH IN VAPOR
H= TOTAL ENTHALPY, BTU/LB A-50
WV= LB VAPOR/ LB A-50

V= TOTAL VOLUME, CU.FT./LB A-50
S= TOTAL ENTROPY, BTU/(LB A-50, DEG F)

A-50 LIQUID

TEMP (DEG F)	PRESS (PSIA)	BUBBLE POINT	VAPOR COMP.	SAT.	SAT.
				LIQUID	VAPOR
25	0.512	0.9606	V 0.0176	174.747	
			H -102.3	27.1	
			S 0.731	1.313	
30	0.593	0.9585	V 0.0176	152.467	
			H -101.2	27.7	
			S 0.740	1.313	
35	0.686	0.9564	V 0.0177	133.389	
			H -100.2	28.3	
			S 0.749	1.313	
40	0.792	0.9542	V 0.0177	117.006	
			H -99.2	28.8	
			S 0.758	1.314	
45	0.911	0.9519	V 0.0178	102.897	
			H -98.1	29.4	
			S 0.767	1.314	
50	1.045	0.9496	V 0.0178	90.713	
			H -97.0	30.0	
			S 0.775	1.315	
55	1.196	0.9472	V 0.0179	80.164	
			H -96.0	30.6	
			S 0.784	1.316	
60	1.366	0.9448	V 0.0179	71.007	
			H -94.9	31.2	
			S 0.792	1.316	
65	1.556	0.9421	V 0.0180	63.054	
			H -93.9	31.8	
			S 0.801	1.318	
70	1.768	0.9395	V 0.0181	56.103	
			H -92.8	32.4	
			S 0.809	1.319	
75	2.005	0.9369	V 0.0181	50.025	
			H -91.8	33.0	
			S 0.817	1.320	
80	2.269	0.9342	V 0.0182	44.699	
			H -90.7	33.6	
			S 0.825	1.321	

A-50 LIQUID

TEMP (DEG F)	PRESS (PSIA)	BUBBLE POINT	VAPOR COMP.	SAT.	SAT.
				LIQUID	VAPOR
85	2.563	0.9315	V	0.0182	40.017
			H	-89.6	34.2
			S	0.832	1.322
90	2.888	0.9287	V	0.0183	35.899
			H	-88.6	34.8
			S	0.840	1.324
95	3.248	0.9258	V	0.0183	32.267
			H	-87.5	35.5
			S	0.848	1.325
100	3.646	0.9229	V	0.0184	29.056
			H	-86.4	36.1
			S	0.855	1.327
105	4.085	0.9200	V	0.0184	26.212
			H	-85.3	36.7
			S	0.862	1.328
110	4.568	0.9170	V	0.0185	23.688
			H	-84.2	37.4
			S	0.870	1.330
115	5.099	0.9139	V	0.0186	21.444
			H	-83.2	38.0
			S	0.877	1.331
120	5.681	0.9108	V	0.0186	19.445
			H	-82.1	38.7
			S	0.884	1.333
125	6.319	0.9076	V	0.0187	17.661
			H	-81.0	39.4
			S	0.891	1.335
130	7.017	0.9044	V	0.0187	16.066
			H	-79.9	40.0
			S	0.898	1.337
135	7.779	0.9011	V	0.0188	14.638
			H	-78.8	40.7
			S	0.904	1.339
140	8.610	0.8978	V	0.0189	13.357
			H	-77.7	41.4
			S	0.911	1.341

A-50 LIQUID

TEMP (DEG F)	PRESS (PSIA)	BUBBLE POINT	VAPOR COMP.	SAT.	SAT.
				LIQUID	VAPOR
145	9.516	0.8944	V	0.0189	12.205
			H	-76.6	42.1
			S	0.918	1.343
150	10.499	0.8910	V	0.0190	11.170
			H	-75.5	42.8
			S	0.924	1.345
155	11.567	0.8875	V	0.0191	10.236
			H	-74.4	43.5
			S	0.931	1.347
160	12.724	0.8840	V	0.0191	9.394
			H	-73.3	44.2
			S	0.937	1.350
165	13.977	0.8804	V	0.0192	8.632
			H	-72.2	44.9
			S	0.943	1.352
170	15.331	0.8768	V	0.0193	7.943
			H	-71.1	45.6
			S	0.949	1.354
175	16.793	0.8731	V	0.0193	7.317
			H	-70.0	46.3
			S	0.955	1.356
180	18.369	0.8693	V	0.0194	6.750
			H	-68.9	47.1
			S	0.961	1.359
185	20.065	0.8655	V	0.0194	6.234
			H	-67.8	47.8
			S	0.967	1.361
190	21.890	0.8617	V	0.0195	5.764
			H	-66.7	48.6
			S	0.973	1.364
195	23.849	0.8578	V	0.0196	5.336
			H	-65.5	49.3
			S	0.979	1.366
200	25.950	0.8538	V	0.0197	4.951
			H	-64.4	50.1
			S	0.984	1.369

A-50 LIQUID

TEMP (DEG F)	PRESS (PSIA)	BUBBLE POINT VAPOR COMP.	SAT.	
			Liquid	Vapor
205	28.203	0.8498	V 0.0197	4.594
			H -63.3	50.9
			S 0.990	1.372
210	30.611	0.8457	V 0.0198	4.268
			H -62.2	51.6
			S 0.996	1.374
215	33.184	0.8415	V 0.0199	3.969
			H -61.0	52.4
			S 1.001	1.377
220	35.931	0.8373	V 0.0199	3.695
			H -59.9	53.2
			S 1.007	1.380
225	38.859	0.8330	V 0.0200	3.444
			H -58.8	54.0
			S 1.012	1.382
230	41.978	0.8287	V 0.0201	3.213
			H -57.6	54.8
			S 1.017	1.385
235	45.294	0.8243	V 0.0201	3.000
			H -56.5	55.6
			S 1.022	1.388
240	48.818	0.8198	V 0.0202	2.805
			H -55.3	56.4
			S 1.027	1.391
245	52.557	0.8152	V 0.0203	2.624
			H -54.2	57.3
			S 1.032	1.394
250	56.521	0.8106	V 0.0204	2.458
			H -53.0	58.1
			S 1.037	1.397
255	60.719	0.8059	V 0.0204	2.304
			H -51.9	59.0
			S 1.042	1.400
260	65.159	0.8011	V 0.0205	2.162
			H -50.7	59.8
			S 1.047	1.403

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP21)

TEMP (DEG F)	BUBBLE POINT PRESS (PSIA)	BUBBLE POINT PRESS (PSIA)	PRESSURE: PSIA	DEW POINT PRESS (PSIA)									
				0.900	0.650	0.400							
35	0.686	X	0.5000	0.1432	0.0949	0.0595	0.0367	0.0217	0.0125	0.0068	X	0.0944	
		Y	0.9564	0.9528	0.9352	0.9161	0.8834	0.8378	0.7544	0.6455	Y		
	VL	0.018	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	VL		
VV	133.391		141.295	186.486	236.864	324.565	460.365	670.747	964.579	1350.297	VV		
HL	-100.2		-120.5	-137.7	-143.0	-146.9	-149.5	-151.1	-152.2	-157.8	HL		
HV	28.25		28.28	28.43	28.60	28.89	29.33	30.02	30.99	32.28	HV		
SL	0.749		0.736	0.734	0.741	0.754	0.769	0.786	0.802	0.817	SL		
SV	1.313		1.318	1.341	1.364	1.401	1.451	1.523	1.616	1.737	SV		
40	0.792	X	0.5000	0.1886	0.1091	0.0746	0.0471	0.0286	0.0161	0.0084	0.0077	X	0.1144
		Y	0.9542	0.9408	0.9195	0.8959	0.8548	0.7901	0.6877	0.5392	0.5000	Y	
VL	0.018		0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	VL		
VV	117.005		144.169	190.818	243.177	335.275	480.129	710.156	1043.433	1126.848	VV		
HL	-99.1		-131.7	-140.3	-144.1	-147.2	-149.2	-150.6	-151.5	-151.6	HL		
HV	28.82		28.94	29.12	29.32	29.69	30.26	31.16	32.48	32.87	HV		
SL	0.750		0.743	0.749	0.757	0.771	0.787	0.805	0.821	0.824	SL		
SV	1.314		1.331	1.357	1.384	1.426	1.487	1.576	1.696	1.724	SV		
45	0.911	X	0.5000	0.4357	0.1378	0.0851	0.0590	0.0371	0.0218	0.0113	0.0075	X	0.1377
		Y	0.9519	0.9510	0.9265	0.9003	0.8710	0.8190	0.7357	0.5980	0.5000	Y	
VL	0.018		0.018	0.016	0.016	0.016	0.016	0.016	0.016	0.016	VL		
VV	102.897		104.210	147.352	195.754	250.789	348.030	504.455	761.031	943.146	VV		
HL	-98.1		-104.6	-136.1	-141.9	-144.7	-147.2	-148.9	-150.0	-150.5	HL		
HV	29.40		29.40	29.61	29.84	30.10	30.55	31.29	32.50	33.38	HV		
SL	0.767		0.763	0.755	0.764	0.774	0.789	0.806	0.824	0.837	SL		
SV	1.314		1.315	1.346	1.376	1.407	1.457	1.531	1.644	1.771	SV		
50	1.045	X	0.5000	0.2101	0.1056	0.0673	0.0467	0.0289	0.0161	0.0090	0.0075	X	0.1655
		Y	0.9496	0.9383	0.9093	0.8770	0.8402	0.7742	0.6652	0.5000	0.5000	Y	
VL	0.018		0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	VL		
VV	90.714		106.366	150.926	201.410	259.395	363.377	534.962	791.684	791.684	VV		
HL	-97.0		-126.3	-138.5	-142.7	-145.0	-147.0	-148.4	-149.3	-149.3	HL		
HV	29.98		30.07	30.32	30.60	30.93	31.51	32.47	33.03	33.03	HV		
SL	0.775		0.763	0.770	0.781	0.791	0.806	0.824	0.840	0.840	SL		
SV	1.315		1.329	1.363	1.397	1.434	1.494	1.586	1.714	1.714	SV		
55	1.196	X	0.5000	0.1546	0.0828	0.0533	0.0367	0.0220	0.0113	0.0085	0.0075	X	0.1714
		Y	0.9472	0.9238	0.8884	0.8483	0.8020	0.7172	0.5732	0.5000	0.5000	Y	
VL	0.018		0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	VL		
VV	80.165		108.711	154.989	208.006	269.629	382.212	573.876	667.954	667.954	VV		
HL	-96.0		-132.0	-139.9	-143.1	-145.0	-146.6	-147.8	-148.1	-148.1	HL		
HV	30.56		30.76	31.07	31.42	31.82	32.57	33.84	34.40	34.40	HV		
SL	0.784		0.774	0.785	0.797	0.808	0.824	0.842	0.860	0.860	SL		
SV	1.316		1.344	1.383	1.423	1.466	1.539	1.655	1.711	1.711	SV		

"REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR."

LIQUID-VAPOR REGION TEMPERATURES ABOVE PTP2)

TEMP (DEG F)	BUBBLE POINT PRESS (PSIA)	RUBBLE POINT PRESS (PSIA)	PRESSURE: PSIA 2.000 1.500	NEW POINT PRESS (PSIA)			NEW POINT (PSIA)		
				1.100	0.900	0.650	0.550	0.400	0.300
60	1.366 X Y	0.5000 0.9448	0.1829 0.9265	0.1173 0.9066	0.0656 0.8637	0.0495 0.6333	0.0296 0.7545	0.0162 0.6447	0.0088 0.5000
VL	0.018	71.006	0.017	0.016	0.016	0.014	0.016	0.016	0.016
VV			89.574	111.323	159.645	193.125	281.867	405.541	565.066
HL	-94.9		-127.9	-135.0	-140.7	-142.4	-144.7	-146.1	-146.9
MV	31.15		31.31	31.48	31.85	32.11	32.81	33.77	35.05
SL	0.792		0.782	0.787	0.801	0.809	0.826	0.841	0.855
SV	1.316		1.338	1.361	1.405	1.434	1.504	1.594	1.706
65	1.556 X Y	0.5000 0.9421	0.3729 0.9387	0.1352 0.9099	0.0915 0.8859	0.0520 0.8323	0.0217 0.7948	0.0112 0.6943	0.0097 0.5483
VL	0.018	63.056	0.017	0.016	0.016	0.016	0.016	0.016	0.016
VV	-93.9		65.598	91.673	114.287	165.085	200.732	296.913	435.792
HL			-106.8	-131.9	-136.7	-141.0	-142.5	-144.4	-145.5
MV	31.75		31.78	32.02	32.23	32.70	33.02	33.91	35.19
SL	0.800		0.796	0.794	0.802	0.817	0.825	0.843	0.861
SV	1.318		1.322	1.354	1.380	1.432	1.466	1.550	1.665
70	1.768 X Y	0.5000 0.9395	0.2137 0.9241	0.1043 0.8902	0.0723 0.8608	0.0410 0.7942	0.0303 0.7470	0.0158 0.6165	0.0097 0.5000
VL	0.018	56.105	0.017	0.016	0.016	0.016	0.016	0.016	0.016
VV	-92.8		67.030	94.034	117.687	171.510	209.839	315.842	469.240
HL			-122.4	-134.2	-137.7	-141.1	-142.3	-143.9	-144.6
MV	32.36		32.48	32.77	33.03	33.60	34.07	35.17	36.10
SL	0.809		0.800	0.808	0.817	0.833	0.842	0.859	0.876
SV	1.319		1.336	1.373	1.402	1.463	1.503	1.608	1.696
75	2.005 X Y	0.5000 0.9369	0.4905 0.9366	0.1533 0.9075	0.0820 0.8666	0.0574 0.8305	0.0320 0.7471	0.0108 0.6868	0.0101 0.5151
VL	0.018	50.027	0.018	0.017	0.016	0.016	0.016	0.016	0.016
VV	-91.7		50.176	68.595	96.720	121.614	179.188	220.963	340.000
HL			-92.7	-127.7	-135.5	-138.2	-141.0	-142.0	-143.3
MV	32.97		32.97	33.21	33.56	33.87	34.60	35.13	36.64
SL	0.817		0.816	0.812	0.823	0.832	0.849	0.858	0.876
SV	1.320		1.320	1.352	1.394	1.428	1.500	1.549	1.641
80	2.269 X Y	0.5000 0.9342	0.2470 0.9212	0.1170 0.8884	0.0651 0.8382	0.0454 0.7932	0.0244 0.6881	0.0169 0.6174	0.0101 0.5000
VL	0.018	44.699	0.017	0.016	0.016	0.016	0.016	0.016	0.016
VV	-90.7		51.297	70.311	99.802	126.238	188.506	244.724	350.601
HL			-116.6	-130.5	-136.2	-138.4	-140.7	-141.5	-142.7
MV	33.58		33.68	33.96	34.39	34.78	35.70	36.38	37.35
SL	0.824		0.819	0.824	0.838	0.848	0.865	0.875	0.885
SV	1.321		1.321	1.370	1.418	1.458	1.545	1.605	1.690

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP2)

TEMP (DEG F)	BUBBLE POINT PRESS (PSIA)	BUBBLE POINT	PRESSURE, PSIA	DEW POINT (PSIA)			
				3.300	2.600	2.000	1.700
85	2.563	X 0.5000	0.1709 0.1174	0.0699 0.0516	0.0321 0.0180	0.0111 0.0111	X 0.542
	Y 0.9315	VL 0.018	0.9042 0.8833	0.8937 0.8032	0.7297 0.6135	0.5000 0.5000	Y VL
	VV 40.017	ML -89.6	0.017 0.017	0.016 0.016	0.016 0.016	0.016 0.016	VV ML
	HV 34.20	SL 0.832	52.499 62.844	85.104 103.433	141.272 138.7	200.095 140.3	258.105 -141.5
	SV 1.322		-123.6 -129.3	-134.5 -136.5	-138.7 -138.7	-140.3 -140.3	ML HV
90	2.888	X 0.5000	0.2736 0.1285	0.0918 0.0555	0.0408 0.0244	0.0124 0.0116	X C.635 X
	Y 0.9287	VL 0.018	0.9166 0.8844	0.8594 0.8057	0.7617 0.6681	0.5168 0.5000	Y VL
	VV 35.900	ML -88.5	40.298 53.835	64.634 88.133	107.624 148.894	214.637 222.140	VV ML
	HV 34.82	SL 0.840	-111.6 -127.0	-131.0 -135.0	-136.6 -138.4	-139.7 -139.7	38.57 HV
	SV 1.324		34.92 35.19	35.40 35.86	36.23 36.23	37.05 37.05	0.899 SL
95	3.248	X 0.5000	0.1839 0.0998	0.0726 0.0440	0.0317 0.0177	0.0122 0.0122	X 0.741 X
	Y 0.9258	VL 0.018	0.8990 0.8609	0.8311 0.7655	0.7098 0.5889	0.5000 0.5000	Y VL
	VV 32.267	ML -87.5	41.255 55.342	66.657 91.613	112.698 158.230	192.011 192.011	VV ML
	HV 35.45	SL 0.847	-119.9 -129.0	-132.0 -135.1	-136.5 -138.0	-138.6 -138.6	39.11 HV
	SV 1.325		35.67 35.99	36.24 36.80	37.28 38.37	38.37 38.37	0.905 SL
100	3.646	X 0.5000	0.2852 0.1367	0.0787 0.0578	0.0343 0.0240	0.0127 0.0127	X 0.862 X
	Y 0.9229	VL 0.018	0.9103 0.8787	0.8334 0.7970	0.7155 0.6455	0.5000 0.5000	Y VL
	VV 29.056	ML -86.4	32.457 42.314	57.047 69.022	91.807 118.827	166.389 166.389	VV ML
	HV 36.09	SL 0.855	-108.2 -123.9	-130.2 -132.4	-135.0 -136.2	-137.4 -137.4	39.71 HV
	SV 1.327		36.19 36.45	36.83 37.13	37.84 38.44	38.44 38.44	0.917 SL
105	4.085	X 0.5000	0.3000 0.1899	0.1057 0.0627	0.0457 0.0261	0.0175 0.0175	X 1.011 X
	Y 0.9200	VL 0.018	0.9019 0.8549	0.8006 0.7559	0.6542 0.5653	0.5000 0.5000	Y VL
	VV 26.212	ML -85.3	33.242 43.500	59.006 71.775	100.823 126.314	144.510 144.510	VV HI
	HV 36.73	SL 0.862	-117.1 -126.1	-130.8 -132.6	-134.8 -135.7	-136.7 -136.7	40.30 HV
	SV 1.328		36.95 37.26	37.71 38.09	38.97 39.74	39.74 39.74	0.910 SL

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP2)

	BUBBLE POINT PRESSURE (PSIA)	BUBBLE POINT PRESSURE: PSIA	PRESSURE: PSIA	3.500	3.000	2.600	2.100	1.700	1.300	DFW POINT	DEW POINT PRESS (PSIA)
TEMP (DEG F)	(PSIA)	5.500	4.500								
110	4.568	X	0.5000	0.4636	0.1635	0.1125	0.0831	0.0496	0.0192	0.0138	X 1.160
	Y	0.9170	0.9148	0.8798	0.8546	0.8270	0.7607	0.7142	0.5770	0.5000	Y
VL	0.019	0.018	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	VL
VV	23.686		24.040	31.919	38.019	44.843	61.306	75.067	106.999	125.866	VV
HL	-84.2		-87.8	-116.7	-124.2	-127.4	-131.1	-132.6	-136.4	-135.0	HL
HV	37.38		37.40	37.67	37.88	38.11	38.67	39.14	40.24	40.91	HV
SL	0.870		0.870	0.871	0.877	0.883	0.896	0.904	0.919	0.926	SL
SV	1.330		1.332	1.366	1.389	1.414	1.470	1.514	1.610	1.665	SV
115	5.099	X	0.5000	0.2617	0.1238	0.0887	0.0661	0.0388	0.0272	0.0144	X 1.340
	Y	0.9139	0.8959	0.8567	0.8271	0.7939	0.7124	0.6436	0.5000	0.5000	Y
VL	0.019	0.017	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	VL
VV	21.443		24.681	32.794	39.177	46.384	64.013	78.981	109.669	VV	
HL	-83.2		-107.3	-121.8	-125.7	-128.1	-131.1	-132.4	-133.8	HL	
HV	38.03		38.17	38.48	38.73	39.00	39.69	40.28	41.57	HV	
SL	0.877		0.877	0.883	0.890	0.897	0.910	0.919	0.922	SL	
SV	1.331		1.349	1.386	1.412	1.440	1.505	1.558	1.641	SV	
120	5.681	X	0.5000	0.4244	0.1797	0.0964	0.0700	0.0527	0.0298	0.0190	X 1.545
	Y	0.9108	0.9056	0.8755	0.8297	0.7938	0.7536	0.6533	0.5658	0.5000	Y
VL	0.019	0.018	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	VL
VV	19.445		20.176	25.309	33.782	40.528	48.190	67.750	93.811	96.124	VV
HL	-82.1		-89.6	-114.7	-123.7	-126.5	-128.5	-130.9	-132.0	-132.6	HL
HV	38.69		38.73	38.97	39.33	39.63	39.97	40.82	41.57	42.13	HV
SL	0.884		0.884	0.887	0.896	0.903	0.910	0.924	0.933	0.939	SL
SV	1.333		1.338	1.367	1.408	1.438	1.471	1.548	1.611	1.659	SV
125	6.319	X	0.5000	0.2502	0.1363	0.0764	0.0554	0.0409	0.0221	—	X 1.776
	Y	0.9076	0.8859	0.8523	0.7979	0.7552	0.7055	0.5799	0.5000	0.5000	Y
VL	0.019	0.018	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	VL
VV	17.660		20.681	26.001	34.904	42.052	50.297	71.182	84.298	VV	
HL	-81.0		-106.2	-118.4	-124.7	-127.0	-128.5	-130.6	-131.3	HL	
HV	39.36		39.52	39.76	40.23	40.58	41.00	42.06	42.75	HV	
SL	0.891		0.892	0.898	0.909	0.917	0.924	0.939	0.945	SL	
SV	1.335		1.355	1.386	1.433	1.467	1.506	1.598	1.651	SV	
130	7.017	X	0.5000	0.1743	0.1038	0.0604	0.0434	0.0315	0.0157	0.0162	X 2.006
	Y	0.9044	0.8642	0.8251	0.7607	0.7081	0.6471	0.5000	0.5000	0.5000	Y
VL	0.019	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.016	0.016	VL
VV	16.066		21.224	26.783	36.184	43.862	52.800	74.170	84.298	VV	
HL	-79.9		-113.0	-120.6	-125.3	-127.1	-128.4	-130.6	-131.3	HL	
HV	40.03		40.33	40.64	41.17	41.61	42.12	42.75	43.11	HV	
SL	0.897		0.902	0.910	0.922	0.930	0.938	0.945	0.951	SL	
SV	1.337		1.374	1.408	1.461	1.502	1.547	1.651	1.691	SV	

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP2)

TEMP (DEG F) PRESS (PSIA)	BUBBLE POINT POINT	PRESSURE: PSIA	DEW POINT PRESS (PSIA)							
			10.000	8.200	6.800	5.500				
135	7.779 X Y VL VV HL HV SL SV	0.5000 0.9011 0.019 14.638 -78.6 40.71 0.904 1.339	0.2574 0.8781 0.018 17.088 -103.2 40.88 0.907 1.360	0.1307 0.8394 0.017 21.825 -116.5 41.17 0.914 1.394	0.0818 0.7932 0.017 27.670 -121.8 41.54 0.923 1.473	0.0600 0.7520 0.017 32.938 -124.1 41.88 0.930 1.466	0.0417 0.6926 0.017 40.631 -126.1 42.37 0.938 1.511	0.0214 0.5748 0.017 55.831 -128.2 43.36 0.958 1.597	0.0169 0.5000 0.017 65.328 -128.9 44.00 0.958 1.648	X Y VL VV
140	8.611 X Y VL VV HL HV SL SV	0.5000 0.8978 0.019 13.357 -77.7 41.39 0.911 1.341	0.3969 0.8888 0.018 14.138 -87.9 41.46 0.913 1.349	0.1782 0.8555 0.017 17.546 -110.3 41.70 0.917 1.379	0.1011 0.8106 0.017 22.502 -118.5 42.05 0.926 1.417	0.0644 0.7556 0.017 28.687 -122.5 42.49 0.935 1.461	0.0471 0.7057 0.017 34.328 -124.4 42.90 0.943 1.499	0.0319 0.6327 0.017 42.677 -126.1 43.51 0.952 1.553	0.0176 0.5000 0.017 57.669 -127.6 44.63 0.964 1.645	X Y VL VV
145	9.516 X Y VL VV HL HV SL SV	0.5000 0.8944 0.019 12.205 -76.6 42.08 0.918 1.343	0.2446 0.8666 0.018 14.512 -102.2 42.28 0.922 1.367	0.1330 0.8297 0.017 18.053 -114.0 42.56 0.922 1.399	0.0796 0.7769 0.017 23.270 -119.7 42.97 0.938 1.442	0.0508 0.7116 0.017 29.953 -122.8 43.50 0.948 1.493	0.0364 0.6507 0.017 35.949 -124.4 44.00 0.956 1.538	0.0237 0.5593 0.017 45.124 -125.8 44.77 0.965 1.602	0.0183 0.5000 0.017 51.031 -126.4 45.26 0.970 1.642	X Y VL VV
150	10.499 X Y VL VV HL HV SL SV	0.5000 0.8910 0.019 11.170 -75.5 42.77 0.924 1.345	0.4007 0.8812 0.019 11.830 -85.3 42.84 0.927 1.354	0.1716 0.8429 0.017 14.914 -108.7 43.12 0.933 1.387	0.1027 0.7999 0.017 18.621 -116.1 43.45 0.940 1.422	0.0628 0.7372 0.017 24.151 -120.4 43.95 0.951 1.471	0.0394 0.6572 0.017 31.253 -122.9 44.60 0.961 1.531	0.0274 0.5832 0.017 37.895 -124.2 45.21 0.969 1.583	0.0190 0.5000 0.017 45.254 -125.1 45.90 0.971 1.640	X Y VL VV
155	11.567 X Y VL VV HL HV SL SV	0.5000 0.8875 0.019 10.236 -74.4 43.47 0.930 1.347	0.2502 0.8582 0.018 12.150 -99.4 43.68 0.937 1.372	0.1288 0.8156 0.017 15.356 -112.1 43.99 0.944 1.408	0.0807 0.7653 0.017 19.264 -117.3 44.38 0.952 1.448	0.0493 0.6903 0.017 25.170 -120.7 44.98 0.963 1.505	0.0209 0.5934 0.017 32.871 -122.8 45.77 0.974 1.574	0.0197 0.5000 0.017 46.101 -123.0 46.55 0.982 1.637	X Y VL VV	

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP?)

BUBBLE POINT PRESS (PSIA)		PRESSURE: PSIA 16.000		11.100		10.000		9.000		8.000		7.000		6.000		5.000		4.000		3.000		2.000		1.000		0.000						
TEMP (DEG F)	AUGUST POINT (PSIA)																															
160	12.724	X	0.5000			0.2509	0.1746	0.0994	0.0635	0.0434	0.0296	0.0125	0.0025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005				
	Y	0.6840			0.8534	0.8332	0.7840	0.7246	0.6565	0.5927	0.5005	0.4177	0.3317	0.2469	0.1717	0.1177	0.0717	0.0317	0.0177	0.0077	0.0027	0.0007	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001				
VL	0.019				0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017				
VV	9.394				11.163	12.493	15.855	20.002	24.569	30.715	35.782	41.225	46.572	51.225	56.725	61.225	66.725	71.225	76.725	81.225	86.725	91.225	96.725	101.225	106.725	111.225	116.725	121.225	126.725			
HL	-73.3				-98.2	-106.1	-114.1	-117.9	-120.1	-123.1	-126.1	-129.1	-132.1	-135.1	-138.1	-141.1	-144.1	-147.1	-150.1	-153.1	-156.1	-159.1	-162.1	-165.1	-168.1	-171.1	-174.1	-177.1	-180.1			
HV	44.18				44.40	44.54	44.91	45.37	45.89	46.52	47.25	47.98	48.71	49.54	50.41	51.31	52.21	53.11	54.01	54.91	55.81	56.71	57.61	58.51	59.41	60.31	61.21	62.11	63.01			
SL	0.937				0.943	0.947	0.955	0.964	0.973	0.981	0.989	0.996	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999			
SV	1.350				1.375	1.392	1.432	1.477	1.525	1.575	1.625	1.675	1.725	1.775	1.825	1.875	1.925	1.975	2.025	2.075	2.125	2.175	2.225	2.275	2.325	2.375	2.425	2.475	2.525			
165	13.977	X	0.5000			0.3603	0.1750	0.1303	0.0779	0.0496	0.0331	0.0214	0.0125	0.0065	0.0035	0.0015	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
	Y	0.8804			0.8642	0.8279	0.8049	0.7474	0.6762	0.5973	0.5015	0.4015	0.3015	0.2015	0.1015	0.0117	0.0017	0.0007	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
VL	0.019				0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017			
VV	8.632				9.416	11.482	12.873	16.421	20.865	25.815	31.941	37.121	42.161	47.194	52.194	57.194	62.194	67.194	72.194	77.194	82.194	87.194	92.194	97.194	102.194	107.194	112.194	117.194	122.194			
HL	-72.2				-85.9	-104.9	-109.6	-115.2	-119.3	-123.1	-126.1	-129.1	-132.1	-135.1	-138.1	-141.1	-144.1	-147.1	-150.1	-153.1	-156.1	-159.1	-162.1	-165.1	-168.1	-171.1	-174.1	-177.1	-180.1			
HV	44.90				45.01	45.26	45.43	45.86	46.42	47.06	47.74	48.41	49.08	50.75	51.42	52.09	52.76	53.43	54.10	54.77	55.44	56.11	56.78	57.45	58.12	58.79	59.46	60.13	60.80			
SL	0.943				0.948	0.954	0.958	0.967	0.977	0.985	0.994	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999			
SV	1.352				1.365	1.395	1.414	1.459	1.511	1.565	1.620	1.675	1.725	1.775	1.825	1.875	1.925	1.975	2.025	2.075	2.125	2.175	2.225	2.275	2.325	2.375	2.425	2.475	2.525			
170	15.331	X	0.5000			0.2319	0.1304	0.1003	0.0611	0.0382	0.0242	0.0125	0.0065	0.0035	0.0015	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
	Y	0.8768			0.8393	0.7990	0.7723	0.7044	0.6198	0.5211	0.4300	0.3399	0.2498	0.1597	0.0696	0.0195	0.0095	0.0045	0.0025	0.0015	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
VL	0.019				0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017			
VV	7.943				9.682	11.835	13.298	17.070	21.859	27.314	32.511	37.511	42.511	47.511	52.511	57.511	62.511	67.511	72.511	77.511	82.511	87.511	92.511	97.511	102.511	107.511	112.511	117.511	122.511			
HL	-71.1				-97.8	-108.4	-111.6	-115.9	-118.3	-121.9	-125.5	-129.1	-132.7	-136.3	-140.9	-144.5	-148.1	-151.7	-155.3	-158.9	-162.5	-166.1	-170.7	-174.3	-177.9	-181.5	-185.1	-188.7	-192.3	-195.9		
HV	45.62				45.87	46.16	46.35	46.87	47.55	48.24	48.93	49.62	50.31	51.00	51.69	52.38	53.07	53.76	54.45	55.14	55.83	56.52	57.21	57.89	58.58	59.27	59.96	60.65	61.34			
SL	0.949				0.958	0.964	0.969	0.974	0.979	0.984	0.989	0.994	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999		
SV	1.354				1.385	1.417	1.438	1.489	1.541	1.593	1.645	1.696	1.748	1.799	1.851	1.903	1.955	2.007	2.059	2.111	2.163	2.215	2.267	2.319	2.371	2.423	2.475	2.527	2.579	2.631		
175	16.793	X	0.5000			0.4092	0.1646	0.1003	0.0782	0.0476	0.0296	0.0125	0.0065	0.0035	0.0015	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
	Y	0.8731			0.8613	0.8123	0.7659	0.7346	0.6536	0.5696	0.4856	0.4036	0.3216	0.2396	0.1576	0.0756	0.0136	0.0036	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VL	7.317				0.019	0.019	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017		
VV	7.000				7.762	9.967	12.278	13.779	17.821	23.042	28.262	33.482	38.702	43.922	49.142	54.362	59.582	64.802	69.922	75.142	80.362	85.582	90.702	95.922	101.142	106.362	111.582	116.702	121.922			
HL	-70.0				-78.8	-103.7	-110.5	-112.8	-116.1	-119.4	-122.7	-126.0	-129.3	-132.6	-135.9	-139.2	-142.5	-145.8	-149.1	-152.4	-155.7	-159.0	-162.3	-165.6	-168.9	-172.2	-175.5	-178.8	-182.1	-185.4		
HV	46.34				46.42	46.75	47.09	47.32	47.95	48.58	49.21	49.84	50.47	51.10	51.73	52.36	52.99	53.62	54.25	54.88	55.51	56.14	56.77	57.40	58.03	58.66	59.29	59.92	60.55	61.18		
SL	0.955				0.959	0.968	0.976	0.984	0.991	0.998	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	
SV	1.356				1.366	1.406	1.442	1.482	1.523	1.569	1.615	1.661	1.707	1.753	1.799	1.845	1.891	1.937	1.983	2.029	2.075	2.121	2.167	2.213	2.259	2.305	2.351</					

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP?)

TEMP (DEG F) (PSIA)	BUBBLE POINT PRESS (PSIA)	BUBBLE POINT PRESS (PSIA)	PRESSURE: PSIA 25,000 21,300	16.000			13,000			11,000			10,000			9,000			8,000			7,000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
				VL	VV	HL	HW	SL	SV	VL	VV	HL	HW	SL	SV	VL	VV	HL	HW	SL	SV	VL	VV	HL	HW	SL	SV																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
165	20.066	X	0.5000	0.3049	0.1815	0.0949	0.0610	0.0475	0.0355	0.0245	0.0145	0.0075	0.0035	0.0015	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		Y	0.8655	0.8375	0.8079	0.7467	0.6825	0.6382	0.5915	0.5475	0.5000	0.4500	0.4000	0.3500	0.3000	0.2500	0.2000	0.1500	0.1000	0.0500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	VL	0.019	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	VV	6.234	7.125	8.225	10.639	13.188	14.970	17.298	20.517	24.517	29.800	34.500	39.500	44.500	49.500	54.500	59.500	64.500	69.500	74.500	79.500	84.500	89.500	94.500	99.500	104.500	109.500	114.500	119.500																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	HL	-67.8	-86.9	-99.6	-108.7	-117.3	-113.8	-115.1	-116.3	-117.6	-118.8	-119.1	-119.4	-119.7	-119.9	-120.1	-120.3	-120.5	-120.7	-120.9	-121.1	-121.3	-121.5	-121.7	-121.9	-122.1	-122.3	-122.5	-122.7	-122.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	HW	47.82	48.00	48.19	48.62	49.10	49.44	49.85	50.52	51.52	52.52	53.52	54.52	55.52	56.52	57.52	58.52	59.52	60.52	61.52	62.52	63.52	64.52	65.52	66.52	67.52	68.52	69.52	70.52	71.52																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	SL	0.967	0.975	0.980	0.990	0.999	1.004	1.010	1.016	1.021	1.026	1.031	1.036	1.041	1.046	1.050	1.054	1.058	1.062	1.066	1.070	1.074	1.078	1.082	1.086	1.090	1.094	1.098	1.102	1.106	1.110																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	SV	1.361	1.384	1.404	1.430	1.454	1.478	1.500	1.521	1.541	1.561	1.581	1.601	1.621	1.641	1.661	1.681	1.701	1.721	1.741	1.761	1.781	1.801	1.821	1.841	1.861	1.881	1.901	1.921	1.941	1.961																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
190	21.890	X	0.5000	0.4246	0.2041	0.1338	0.0737	C.0473	C.0262	C.0161	C.0061	C.0026	C.0016	C.0006	C.0002	C.0001	C.0000	C.0000	C.0000	C.0000	C.0000	C.0000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Y	0.8617	0.8502	0.8099	0.7768	0.7053	0.6207	0.5764	0.5358	0.5058	0.4858	0.4658	0.4458	0.4258	0.4058	0.3858	0.3658	0.3458	0.3258	0.3058	0.2858	0.2658	0.2458	0.2258	0.2058	0.1858	0.1658	0.1458	0.1258	0.1058	0.0858	0.0658	0.0458	0.0258	0.0058																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	VL	0.020	0.019	0.018	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	VV	5.764	6.071	7.338	8.487	11.043	13.779	15.715	18.484	21.844	24.517	27.517	30.517	33.517	36.517	39.517	42.517	45.517	48.517	51.517	54.517	57.517	60.517	63.517	66.517	69.517	72.517	75.517	78.517	81.517	84.517	87.517	90.517	93.517	96.517	99.517	102.517	105.517	108.517	111.517	114.517	117.517	120.517	123.517	126.517	129.517	132.517	135.517	138.517	141.517	144.517	147.517	150.517	153.517	156.517	159.517	162.517	165.517	168.517	171.517	174.517	177.517	180.517	183.517	186.517	189.517	192.517	195.517	198.517	201.517	204.517	207.517	210.517	213.517	216.517	219.517	222.517	225.517	228.517	231.517	234.517	237.517	240.517	243.517	246.517	249.517	252.517	255.517	258.517	261.517	264.517	267.517	270.517	273.517	276.517	279.517	282.517	285.517	288.517	291.517	294.517	297.517	300.517	303.517	306.517	309.517	312.517	315.517	318.517	321.517	324.517	327.517	330.517	333.517	336.517	339.517	342.517	345.517	348.517	351.517	354.517	357.517	360.517	363.517	366.517	369.517	372.517	375.517	378.517	381.517	384.517	387.517	390.517	393.517	396.517	399.517	402.517	405.517	408.517	411.517	414.517	417.517	420.517	423.517	426.517	429.517	432.517	435.517	438.517	441.517	444.517	447.517	450.517	453.517	456.517	459.517	462.517	465.517	468.517	471.517	474.517	477.517	480.517	483.517	486.517	489.517	492.517	495.517	498.517	501.517	504.517	507.517	510.517	513.517	516.517	519.517	522.517	525.517	528.517	531.517	534.517	537.517	540.517	543.517	546.517	549.517	552.517	555.517	558.517	561.517	564.517	567.517	570.517	573.517	576.517	579.517	582.517	585.517	588.517	591.517	594.517	597.517	600.517	603.517	606.517	609.517	612.517	615.517	618.517	621.517	624.517	627.517	630.517	633.517	636.517	639.517	642.517	645.517	648.517	651.517	654.517	657.517	660.517	663.517	666.517	669.517	672.517	675.517	678.517	681.517	684.517	687.517	690.517	693.517	696.517	699.517	702.517	705.517	708.517	711.517	714.517	717.517	720.517	723.517	726.517	729.517	732.517	735.517	738.517	741.517	744.517	747.517	750.517	753.517	756.517	759.517	762.517	765.517	768.517	771.517	774.517	777.517	780.517	783.517	786.517	789.517	792.517	795.517	798.517	801.517	804.517	807.517	810.517	813.517	816.517	819.517	822.517	825.517	828.517	831.517	834.517	837.517	840.517	843.517	846.517	849.517	852.517	855.517	858.517	861.517	864.517	867.517	870.517	873.517	876.517	879.517	882.517	885.517	888.517	891.517	894.517	897.517	900.517	903.517	906.517	909.517	912.517	915.517	918.517	921.517	924.517	927.517	930.517	933.517	936.517	939.517	942.517	945.517	948.517	951.517	954.517	957.517	960.517	963.517	966.517	969.517	972.517	975.517	978.517	981.517	984.517	987.517	990.517	993.517	996.517	999.517	1002.517	1005.517	1008.517	1011.517	1014.517	1017.517	1020.517	1023.517	1026.517	1029.517	1032.517	1035.517	1038.517	1041.517	1044.517	1047.517	1050.517	1053.517	1056.517	1059.517	1062.517	1065.517	1068.517	1071.517	1074.517	1077.517	1080.517	1083.517	1086.517	1089.517	1092.517	1095.517	1098.517	1101.517	1104.517	1107.517	1110.517	1113.517	1116.517	1119.517	1122.517	1125.517	1128.517	1131.517	1134.517	1137.517	1140.517	1143.517	1146.517	1149.517	1152.517	1155.517	1158.517	1161.517	1164.517	1167.517	1170.517	1173.517	1176.517	1179.517	1182.517	1185.517	1188.517	1191.517	1194.517	1197.517	1200.517	1203.517	1206.517	1209.517	1212.517	1215.517	1218.517	1221.517	1224.517	1227.517	1230.517	1233.517	1236.517	1239.517	1242.517	1245.517	1248.517	1251.517	1254.517	1257.517	1260.517	1263.517	1266.517	1269.517	1272.517	1275.517	1278.517	1281.517	1284.517	1287.517	1290.517	1293.517	1296.517	1299.517	1302.517	1305.517	1308.517	1311.517	1314.517	1317.517	1320.517	1323.517	1326.517	1329.517	1332.517	1335.517	1338.517	1341.517	1344.517	1347.517	1350.517	1353.517	1356.517	1359.517	1362.517	1365.517	1368.517	1371.517	1374.517	1377.517	1380.517	1383.517	1386.517	1389.517	1392.517	1395.517	1398.517	1401.517	1404.517	1407.517	1410.517	1413.517	1416.517	1419.517	1422.517	1425.517	1428.517	1431.517	1434.517	1437.517	1440.517	1443.517	1446.517	1449.517	1452.517	1455.517	1458.517	1461.517	1464.517	1467.517	1470.517	1473.517	14

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP2)

	BUBBLE POINT PRESS (DEG F) (PSIA)	BUBBLE POINT	PRESSURE: PSIA	29.000	25.000	23.000	21.000	18.000	16.000	DEW POINT	DEW POINT PRESS (PSIA)
210	30.610 X Y 0.8457 VL 0.020	0.5000 0.8285 0.019	0.1964 0.7836 0.018	0.1419 0.7569 0.018	0.1048 0.7246 0.018	0.0661 0.6596 0.017	0.0468 0.5982 0.017	0.0291 0.5000 0.017	X 13.777 Y VL		
VV	4.268	4.575	5.515	6.130	6.891	8.445	9.922	12.296	VV		
HL	-62.2	-71.4	-92.1	-97.8	-101.7	-105.8	-107.9	-109.8	HL		
MW	51.63	51.73	51.99	52.16	52.36	52.81	53.25	53.99	HV		
SL	0.996	1.001	1.011	1.015	1.020	1.028	1.035	1.043	SL		
SV	1.374	1.387	1.421	1.440	1.463	1.509	1.550	1.613	SV		
215	33.105 X Y 0.8415 VL 0.020	0.5000 0.8396 0.020	0.4905 0.7983 0.019	0.1419 0.7504 0.018	0.1068 0.7200 0.018	0.0805 0.6826 0.018	0.0507 0.6061 0.017	0.0351 0.5327 0.017	X 15.290 Y VL		
VV	3.969	3.998	4.721	5.698	6.347	7.155	8.823	10.429	VV		
HL	-61.0	-61.9	-83.4	-96.6	-100.3	-103.1	-106.3	-108.0	HL		
MW	52.42	52.43	52.66	52.94	53.13	53.38	53.92	54.45	HV		
SL	1.001	1.002	1.014	1.022	1.026	1.031	1.039	1.046	SL		
SV	1.377	1.378	1.409	1.444	1.466	1.492	1.543	1.590	SV		
220	35.932 X Y 0.8373 VL 0.020	0.5000 0.8086 0.019	0.3500 0.7667 0.018	0.1851 0.7130 0.018	0.1067 0.6778 0.018	0.0818 0.6341 0.018	0.0619 0.5433 0.017	0.0311 0.5000 0.017	X 16.943 Y VL		
VV	3.695	4.129	4.873	5.901	6.590	7.454	9.259	10.119	VV		
HL	-59.9	-74.3	-90.9	-99.1	-101.7	-103.9	-106.4	-107.2	HL		
MW	53.21	53.36	53.60	53.92	54.15	54.45	55.10	55.41	HV		
SL	1.006	1.016	1.024	1.032	1.037	1.042	1.050	1.054	SL		
SV	1.360	1.380	1.401	1.431	1.469	1.494	1.523	1.587	SV		
225	38.859 X Y 0.8330 VL 0.020	0.5000 0.8156 0.020	0.4148 0.7771 0.019	0.2336 0.7317 0.018	0.1344 0.6700 0.018	0.0814 0.6290 0.018	0.0626 0.5773 0.018	0.0321 0.5000 0.017	X 18.745 Y VL		
VV	3.444	3.675	4.263	5.039	6.129	6.867	7.800	Q.190	VV		
HL	-58.8	-66.9	-84.8	-95.0	-100.6	-102.6	-104.2	-105.9	HL		
MW	54.01	54.10	54.30	54.56	54.95	55.23	55.58	56.14	HV		
SL	1.012	1.018	1.027	1.034	1.042	1.047	1.052	1.059	SL		
SV	1.382	1.395	1.423	1.455	1.498	1.525	1.559	1.607	SV		
230	41.978 X Y 0.8287 VL 0.020	0.5000 0.7835 0.019	0.2828 0.7433 0.018	0.1632 0.6921 0.018	0.1009 0.6204 0.018	0.0624 0.5720 0.018	0.0478 0.5106 0.018	0.0352 0.5000 0.017	X 20.711 Y VL		
VV	3.213	3.796	4.406	5.219	6.389	7.186	8.201	8.372	VV		
HL	-57.6	-78.6	-90.8	-97.3	-101.4	-103.0	-104.3	-104.5	HL		
MW	54.82	55.05	55.27	55.57	56.03	56.36	56.79	56.87	HV		
SL	1.017	1.030	1.038	1.045	1.053	1.058	1.063	1.064	SL		
SV	1.385	1.418	1.446	1.482	1.529	1.561	1.599	1.606	SV		

LIQUID-VAPOR REGION TEMPERATURES ABOVE PTP21 (FOR ONE POUND OF A-50)

	BUBBLE POINT PRESSURE (PSIA)	BUBBLE POINT PRESSURE: PSIA	PRESSURE: PSIA	0.500	0.400	0.300	0.220	0.160	0.120	DEW POINT	DEW POINT PRESSURE (PSI)
35	0.686 X 0.5000 Y 0.9564 L 1.0000	0.3032 0.1432 0.9528 0.9352 0.6970 0.5495	0.0949 0.0595 0.9161 0.8834 0.5067 0.4654	0.0367 0.0217 0.8328 0.7546 0.4180 0.3474	0.0125 0.0068 0.6455 0.5000 0.2299 0.0000	X C94					
H -100.2 S 0.749	42.822 84.029 -75.44 -62.86 0.913 1.004	116.842 173.534 -58.36 -52.93 1.049 1.099	267.940 437.737 -45.40 -32.91 1.166 1.267	74.2.831 135.0.231 -11.12 37.27 1.429 1.737	H S						
40	0.792 X 0.5000 Y 0.9542 L 1.0000	0.1886 0.1091 0.9408 0.9195 0.5860 0.5176	0.7746 0.0471 0.8959 0.8548 0.4821 0.4393	0.0286 0.0161 0.7901 0.6877 0.3810 0.2795	0.0084 0.0072 0.5397 0.5000 0.0739 0.0000	X Y L					
H -99.14 S 0.758	59.690 92.055 -65.19 -58.60 0.986 1.042	125.958 188.001 -54.30 -48.01 1.082 1.138	297.217 511.685 -38.13 -19.65 1.122 1.360	966.294 1126.793 18.88 32.81 1.631 1.726	H S						
D-30 45	0.911 X 0.5000 Y 0.9519 L 1.0000	0.4357 0.1378 0.9510 0.9265 0.8752 0.5407	0.0851 0.0590 0.9003 0.8710 0.4911 0.4569	0.0371 0.0218 0.7357 0.5989 0.3301 0.1683	0.0075 0.0075 0.5000 0.5000 0.0000 0.0000	X Y L					
H -98.09 S 0.767	13.022 67.683 -87.89 -59.99 0.832 1.027	99.633 136.222 -54.48 -49.78 1.076 1.118	206.039 337.918 -41.96 -28.19 1.184 1.292	632.959 1.78 1.78 1.506 1.506 1.721	H S						
50	1.045 X 0.5000 Y 0.9496 L 1.0000	0.2181 0.1056 0.9383 0.9093 0.6086 0.5093	0.0673 0.0467 0.8770 0.8402 0.4657 0.4267	0.0289 0.0161 0.7742 0.6652 0.3679 0.2545	C.0086 0.0086 0.0000 0.0000 0.0000 0.0000	X Y L					
H -97.04 S 0.775	41.643 74.074 -65.10 -55.65 0.984 1.061	107. 148.190 -50.00 -44.49 1.110 1.158	229.696 398.812 -34.15 -13.56 1.241 1.392	791.6445 33.92 33.92 1.715 1.715 1.715	H S						
55	1.196 X 0.5000 Y 0.9472 L 1.0000	0.1556 0.0828 0.9238 0.8884 0.5510 0.4821	0.0533 0.0367 0.8483 0.8020 0.4381 0.3946	0.0113 0.0220 0.7172 0.5732 0.3125 0.1303	0.0044 0.0044 0.5000 0.5000 0.0000 0.0000	X Y L					
H -95.99 S 0.784	48.820 80.272 -56.94 -51.35 1.030 1.094	116.882 163.239 -45.06 -37.94 1.149 1.206	262.790 499.054 23.41 10.17 1.316 1.549	667.923 32.44 32.44 1.715 1.715 1.715	H S						

NOMENCLATURE: X = WEIGHT FRACTION UDMM IN LIQUID PHASE
 L = LB LIQUID/ LB TOTAL
 H = TOTAL ENTHALPY (BTU/LB A-50)

Y = WEIGHT FRACTION UDMM IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./LB A-50)
 S = TOTAL ENTROPY (BTU/IR A-50 - DEG F)

Liquid-Vapor Region (Temperatures Above PTP2) (For One Pound of A-50)

	BUBBLE POINT PRESSURE (PSIA) (DEG F)	BUBBLE POINT PRESSURE: PSIA 2.000 1.500	TEMP (DEG F)	TEMP (DEG F)	PRESSURE: PSIA 2.000 1.500	DEW POINT PRESSURE (PSIA)
60	1.366 X 0.5000 Y 0.9448 L 1.000 V -94.93 H 0.792 S	0.1829 0.1173 0.9265 0.9066 0.5735 0.5152 38.210 53.982 -59.99 -54.27 1.019 1.065	0.0656 0.0495 0.9632 0.8333 0.4553 0.4252 86.959 111.007 -46.70 -42.11 1.130 1.168	0.0286 0.0162 0.7545 0.6447 0.3506 0.2302 183.047 312.170 -29.45 -7.65 1.266 1.421	0.0098 0.0000 0.5000 0.0000 0.0000 0.0000 56.6038 35.04 H 1.706 S	X 0.236 Y L V H S
65	1.556 X 0.5000 Y 0.9421 L 1.000 V -93.87 H 0.800 S	0.3729 0.1352 0.9387 0.9099 0.7754 0.5292 14.748 43.172 -75.64 -54.72 0.914 1.058	0.0915 0.0520 0.8659 0.6323 0.4858 0.4258 58.777 94.792 -49.82 -41.28 1.099 1.170	0.0390 0.0217 0.7948 0.6943 0.3900 0.2889 122.450 211.134 -35.42 -17.60 1.216 1.346	0.0112 0.0092 0.5683 0.5000 0.0899 0.0000 396.627 480.287 18.95 35.61 1.592 1.701	X 0.280 Y L V H S
D-31	70 1.769 X 0.5000 Y 0.9395 L 1.000 V -92.81 H 0.809 S	0.2137 0.1043 0.9241 0.8902 0.5970 0.4965 27.023 47.353 -59.95 -50.11 1.016 1.093	0.0723 0.0410 0.8608 0.7942 0.4575 0.3906 63.847 104.525 -45.07 -34.64 1.134 1.217	0.0303 0.0158 0.7470 0.6165 0.3446 0.1940 137.530 254.587 -26.74 0.43 1.275 1.463	0.0097 0.0092 0.6165 0.5000 0.1940 0.0000 409.260 36.18 1.463 1.696	X 0.332 Y L V H S
75	2.005 X 0.5000 Y 0.9369 L 1.000 V -91.75 H 0.817 S	0.4905 0.1533 0.9366 0.9075 0.9786 0.5403 1.084 31.541 -90.02 -53.74 0.827 1.060	0.0820 0.0574 0.9666 0.8305 0.5403 0.4673 0.4673 0.4275 51.535 69.636 -45.42 -39.01 1.060 1.127	0.0320 0.0231 0.7471 0.6868 0.3455 0.2814 0.3455 0.2814 117.281 158.785 -26.06 -14.71 1.173 1.275	0.0108 0.0101 0.5151 0.5000 0.0300 0.0000 329.8C7 350.543 31.24 36.18 1.275 1.696	X 0.342 Y L V H S
80	2.269 X 0.5000 Y 0.9342 L 1.000 V -90.68 H 0.824 S	0.2470 0.1170 0.9212 0.8884 0.6247 0.5035 19.264 34.920 -60.20 -48.85 1.012 1.095	0.0651 0.0454 0.8884 0.7932 0.5035 0.4374 56.153 76.747 -40.23 -33.11 1.064 1.219	0.0244 0.0169 0.6881 0.6154 0.2834 0.1861 135.080 191.046 -14.30 3.27 1.352 1.469	0.0106 0.0106 1.5000 0.0000 0.0000 300.403 37.34 H 1.469 S	X 0.461 Y L V H S

NOMENCLATURE: X = WEIGHT FRACTION UDMH IN LIQUID PHASE
 L = LB LIQUID/ LB TOTAL
 H = TOTAL ENTHALPY (BTU/ LB A-50)

Y = WEIGHT FRACTION UDMH IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./ LB A-50)
 S = TOTAL ENTROPY (BTU/ LB A-50 - DFG. F)

Liquid-Vapor Region (Temperatures Above PTP2) (For One Pound of A-50)

	BUBBLE POINT PRESSURE (PSIA)	BUBBLE POINT TEMP (DEG F)	PRESSURE: PSIA	TEMP: DEG F	2.600	2.000	1.700	1.300	1.100	0.950	0.650	NEW POINT	NEW POINT PRESS (PSIA)
85	2.563	X 0.5000 Y 0.9315 L 1.000 V -89.62 H 0.832	0.1709 C.9042 C.5512 0.5005 23.571 -52.67 1.063	0.1174 0.8833 0.5005 0.4413 31.398 -47.46 1.103	0.0699 0.8397 0.4413 0.4034 47.558 -39.82 1.163	0.0516 0.8032 0.4034 0.3293 61.714 -34.04 1.207	0.0321 0.7297 0.3293 0.1898 94.757 -21.58 1.207	0.0180 0.6130 0.1898 0.0000 162.112 3.30 1.463	0.0111 0.5000 0.0000 258.097 758.097 37.92 1.684	X C.542 Y Y L Y V Y H S			
90	2.888	X 0.5000 Y 0.9287 L 1.000 V -88.55 H 0.840	0.2736 0.9166 0.6479 14.199 -60.00 1.012	0.1285 0.8844 0.5085 26.470 -47.29 1.101	0.0918 0.8594 0.4682 34.380 -42.51 1.138	0.0555 0.8057 0.4074 52.230 -33.75 1.205	0.0408 0.7617 0.3631 68.556 -26.51 1.257	0.02644 0.6681 0.2611 109.958 -8.76 1.379	0.0124 1.5168 0.0333 207.492 72.44 1.647	0.0116 0.5000 0.0000 222.179 18.51 1.670	X 0.035 Y Y L Y V Y H S		
D-32	3.248	X 0.5000 Y 0.9258 L 1.000 V -87.47 H 0.847	0.1839 0.8990 0.5579 18.246 -51.15 1.070	0.0998 0.8609 0.4742 29.105 -42.25 1.136	0.0726 0.8311 0.4365 37.573 -37.18 1.174	0.0440 0.7655 0.3680 57.903 -26.46 1.253	0.0317 0.7098 0.3094 77.837 -16.47 1.322	0.0177 0.5889 0.1556 133.609 10.89 1.500	0.0122 0.5000 0.0000 192.002 19.10 1.676	X 0.741 Y Y L Y V Y H S			
100	3.646	X 0.5000 Y 0.9229 L 1.000 V -86.40 H 0.855	0.2852 0.9103 0.6564 11.165 -58.55 1.020	0.1367 0.8787 0.5103 20.728 -45.37 1.109	0.0787 0.8134 0.4418 31.852 -36.94 1.172	0.0578 0.7155 0.4018 41.294 -31.00 1.216	0.0343 0.6455 0.3163 65.506 -16.84 1.314	0.0240 0.6455 0.2341 91.015 -2.43 1.409	0.0127 0.5000 0.0000 166.390 39.70 1.677	X C.662 Y Y L Y V Y H S			
105	0.085	X 0.5000 Y 0.9200 L 1.000 V -85.33 H 0.862	0.1699 0.8919 0.5582 14.694 -49.02 1.080	0.1057 0.8549 0.4737 22.901 -40.12 1.144	0.0627 0.8006 0.4074 34.976 -30.92 1.212	0.0457 0.7559 0.3603 45.922 -23.41 1.265	0.0261 0.6542 0.2455 76.079 -3.68 1.396	0.0175 0.5653 0.1193 111.251 18.81 1.537	0.0133 0.5000 0.0000 144.530 40.30 1.668	X 1.001 Y Y L Y V Y H S			

NOMENCLATURE: X = WEIGHT FRACTION UDMH IN LIQUID PHASE
 L = LB LIQUID/LB TOTAL
 H = TOTAL ENTHALPY (BTU/LB A-50)

Y = WEIGHT FRACTION UDMH IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./LB A-50)
 S = TOTAL ENTROPY (BTU/LB A-50 - DFG F)

Liquid-Vapor Region (Temperatures Above PTP2) (For One Pound of A-50)

		BUBBLE POINT PRESS (PSIA)	PRESSURE: PSIA 5.500 4.500	3.500	3.000	2.600	2.200	1.700	1.300	NFW POINT (PSIA)
110	4.568	X 0.5000 Y 0.9170 L 1.0000 V -	0.4636 0.9148 0.9193 1.961	0.1635 0.8798 0.5302 15.004	0.1125 0.9270 0.4396 19.859	0.0831 0.7607 0.3666 25.137	0.0496 0.7052 0.3064 38.837	0.0197 0.5777 0.1381 52.070	0.0139 0.5000 0.0000 52.277	X 1.160 Y L V
	H -84.25 S 0.8669		-77.73 0.907	-45.25 1.104	-39.57 1.144	-34.65 1.181	-23.56 1.259	-13.48 1.327	16.13 1.514	40.00 1.664
115	5.099	X 0.5000 Y 0.9139 L 1.0000 V -	0.2617 0.8959 0.6242 9.286	0.1238 0.8567 0.4867 16.840	0.0882 0.8271 0.4427 21.840	0.0661 0.7939 0.4038 27.661	0.0388 0.7124 0.3154 43.831	0.0272 0.6436 0.2329 60.590	0.0144 0.5000 0.0000 109.843	X 1.340 Y L V
	H -83.16 S 0.8777		-52.60 1.054	-39.55 1.141	-34.06 1.181	-29.47 1.221	-14.16 1.318	-0.07 1.409	41.51 1.661	H S
D-33	5.681	X 0.5000 Y 0.9108 L 1.0000 V -	0.4244 0.9056 0.8429 3.185	0.1797 0.8755 0.5397 11.659	0.0964 0.8297 0.4496 18.601	0.0700 0.7938 0.4059 24.085	0.0522 0.7536 0.3616 30.769	0.0298 0.6533 0.2458 50.721	0.0199 0.5659 0.1206 73.707	X 1.545 Y L V
	H -82.08 S 0.8884		-69.40 0.956	-43.98 1.108	-33.95 1.178	-27.81 1.221	-20.94 1.268	-1.40 1.395	20.64 1.530	H S
125	6.319	X 0.5000 Y 0.9076 L 1.0000 V -	0.2502 0.8859 0.6076 8.137	0.1343 0.8523 0.4907 13.252	0.0764 0.7979 0.4128 20.501	0.0554 0.7552 0.3647 26.722	0.0409 0.7055 0.3093 34.747	0.0221 0.5799 0.1432 45.992	0.0157 0.5000 0.0000 46.119	X 1.776 Y L V
	H -81.00 S 0.8911		-48.93 1.074	-37.84 1.147	-27.86 1.216	-20.52 1.266	-11.44 1.326	17.34 1.504	42.17 1.658	H S
130	7.017	X 0.5000 Y 0.9044 L 1.0000 V -	0.1743 0.8642 0.5279 10.029	0.1038 0.8251 0.4507 14.719	0.0604 0.7607 0.3723 22.720	0.0434 0.7081 0.3130 30.136	0.0315 0.6471 0.2389 40.190	0.0163 0.5000 0.0000 74.124	X 2.036 Y L V	
	H -79.91 S 0.897		-40.62 1.125	-32.01 1.184	-20.79 1.260	-11.21 1.323	1.37 1.402	43.34 1.651	H S	

NOMENCLATURE: X = WEIGHT FRACTION UDMM IN LIQUID PHASE
 L = LB LIQUID/LB TOTAL
 H = TOTAL ENTHALPY (BTU/LB A-50)
 S = TOTAL ENTROPY (BTU/LB A-50 - DEG F)

Y = WEIGHT FRACTION UDMM IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./LB A-50)
 S = TOTAL ENTROPY (BTU/LB A-50 - DEG F)

Liquid-Vapor Region (Temperatures Above PTP2) (For One Pound of A-50)

		BUBBLE POINT PRESSURE: PSIA		DEW POINT PRESS (PSIA)			
TEMP (DEG F)	BUBBLE POINT	10.000	8.200	6.800	5.500	4.500	3.900
135	7.779	X 0.5000	0.2574	0.1307	0.0818	0.0600	0.0417
	Y 0.9011	0.8781	0.8394	0.7932	0.7520	0.6926	0.5748
	L 1.0000	0.6092	0.4789	0.4122	0.3641	0.2959	0.1357
	V -78.82	6.689	11.381	16.273	20.950	28.612	48.257
	S 0.904	-46.88	-34.35	-25.77	-18.58	-7.50	20.09
140	8.610	X 0.5000	0.3969	0.1782	0.1011	0.0646	0.0471
	Y 0.8978	0.8888	0.8555	0.8106	0.7556	0.7057	0.631
	L 1.0000	0.7903	0.5248	0.4378	0.3699	0.3123	0.2201
	V -77.72	2.979	8.346	12.659	18.001	23.611	33.257
	S 0.911	-60.76	-38.09	-28.25	-18.54	-9.35	6.07
145	9.516	X 0.5000	0.2446	0.1330	0.0796	0.0508	0.0364
	Y 0.8944	0.8668	0.8297	0.7769	0.7116	0.6507	0.5593
	L 1.0000	0.5895	0.4732	0.3971	0.3202	0.2453	0.1107
	V -76.63	5.968	9.518	14.036	20.300	27.135	40.138
	S 0.917	-42.91	-31.51	-21.63	-9.76	2.70	75.88
150	10.499	X 0.5000	0.4007	0.1716	0.1027	0.0628	0.0394
	Y 0.8910	0.8812	0.8428	0.7999	0.7372	0.6572	0.5832
	L 1.0000	0.7934	0.5107	0.4302	0.3517	0.2544	0.1497
	V -75.53	2.459	7.307	10.618	15.662	23.305	32.723
	S 0.924	-58.80	-34.42	-25.16	-13.85	1.98	19.84
155	11.567	X 0.5000	0.2502	0.1289	0.0807	0.0493	0.0299
	Y 0.8875	0.8582	0.8156	0.7653	0.6903	0.5934	0.5200
	L 1.0000	0.5891	0.4595	0.3875	0.2968	0.1657	0.0000
	V -74.43	5.003	8.309	11.806	17.703	27.427	40.189
	S 0.930	-40.60	-27.73	-18.26	-4.19	17.84	46.5%

NOMENCLATURE: X = WEIGHT FRACTION UDMH IN LIQUID PHASE
 L = LB LIQUID/LB TOTAL
 H = TOTAL ENTHALPY (BTU/LB A-50 C)
 S = TOTAL ENTROPY (BTU/LB A-50 - DEG F)

Y = WEIGHT FRACTION UDMH IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./LB A-50)
 S = TOTAL ENTROPY (BTU/LB A-50 - DEG F)

DEW POINT PRESS (PSIA)
 NEW PRINT

Liquid-Vapor Region (Temperatures Above PTP 2) (For One Pound of A-50)

TEMP (DEG F)	BUBBLE POINT PRESS (PSIA)	BUBBLE POINT	PRESSURE: PSIA	PRESSURE: 16.000 13.000 11.000 10.000	0.200	6.000	5.000	4.000	NEW POINT	LEW POINT (PSIA)
160	12.724	X 0.5000 Y 0.8840 L 1.0000	0.1746 0.8332 0.5059	0.0994 0.7845 0.4149	0.0635 0.7246 0.3398	0.0434 0.6595 0.2589	0.0296 0.5927 0.1475	0.0205 0.5051 0.1022	X 4.0424 Y 4.0505 L 4.0524	
		V	4.625	6.182	9.284	13.712	18.212	25.520	V	35.790
		H	-73.33	-31.67	-21.05	-10.12	-9.1	21.37	H	47.17
		S	0.937	1.167	1.234	1.303	1.382	1.480	S	1.674

165	13.977	X	0.5000	0.3673	0.1750	0.1303	0.0779	0.0496	0.0331	0.0214	0.0177
	Y	0.8804	0.8642	0.8279	0.8049	0.7474	0.6742	0.5971	0.5114	0.4661	0.4157
L	1.0000	0.7228	0.5022	0.4519	0.3695	0.2812	0.1724	0.1342	0.1111	0.0991	0.0871
V		2.624	5.725	7.053	10.359	14.998	21.352	31.737	31.957	31.974	31.985
H	-72.22	-49.63	-30.14	-24.64	-13.66	0.10	18.74	47.27	47.86	48.44	49.03
S	0.943	1.063	1.174	1.208	1.277	1.341	1.466	1.629	1.677	1.697	1.715

D-35

170	15.331	X	0.5000	0.2319	0.1304	0.1003	0.0611	0.0382	0.0242	0.0221	X	5.6711
		Y	0.8768	0.8393	0.7990	0.7723	0.7044	0.6188	0.5211	0.5077	Y	7.5777
	1.0000	L	0.5587	0.4472	0.4052	0.3177	0.2046	0.0425	0.0000	0.0000	L	1
		V	4.283	6.550	7.917	11.657	17.389	26.153	28.515	28.515	V	1
	-71.11	H	-34.40	-22.97	-17.66	-4.83	13.60	41.18	49.50	49.50	H	4
	0.949	S	1.146	1.215	1.248	1.327	1.435	1.599	1.620	1.620	S	5
175	16.793	X	0.5000	0.4092	0.1646	0.1003	0.0782	0.0476	0.0286	0.0278	X	6.3577
		Y	0.8731	0.8613	0.8123	0.7659	0.7346	0.6536	0.5496	0.5217	Y	7.5777
	1.0000	L	0.7991	0.4821	0.3995	0.3575	0.2534	0.0953	0.0000	0.0000	L	1
		V	1.574	5.170	7.349	8.859	13.209	20.918	25.512	25.512	V	2
	-70.01	H	-53.67	-25.76	-15.86	-9.93	6.36	32.97	49.17	49.17	H	3
	0.955	S	1.041	1.195	1.256	1.292	1.389	1.538	1.627	1.627	S	4
180	18.369	X	0.5000	0.2631	0.1234	0.0781	0.0613	0.0363	0.0237	0.0237	X	7.118
		Y	0.8693	0.8354	0.7815	0.7274	0.6904	0.5930	0.5000	0.5000	Y	8.5777
	1.0000	L	0.5860	0.4277	0.3502	0.3026	0.1671	0.0000	0.0000	0.0000	L	1
		V	3.317	5.892	8.243	10.000	15.578	22.875	22.875	22.875	V	2
	-68.89	H	-34.51	-18.42	-7.88	-0.62	21.48	49.80	49.80	49.80	H	3
	0.961	S	1.142	1.236	1.300	1.343	1.470	1.620	1.620	1.620	S	4

NOMENCLATURE: X = WEIGHT FRACTION UDMH IN LIQUID PHASE
 L = LB LIQUID / LB TOTAL
 H = TOTAL ENTHALPY / BTU/LB A-50)

WEIGHT FRACTION W_MH IN VANDO DRAFT
= TOTAL VOLUME (CU.FT.) / (P A - P_C)
= TOTAL ENTROPY (BTU) / (R A - R_C) - DFC (%)

LIQUID-VAPOR REGION (TEMPERATURES ABOVE PTP2) (FOR ONE POUND OF A-50)

	BUBBLE POINT PRESSURE (PSIA)	BUBBLE POINT PRESSURE: PSIA 25.000	PRESSURE: PSIA 21.000	18.000	16.000	13.000	11.000	10.000	9.000	NEW POINT	NEW POINT	NEW POINT
185	20.066	X 0.5000	C. 304.9	0.1815	0.0949	0.0610	0.0475	0.0355	0.0245	X 0.5945	X 0.5945	X 0.5945
	Y 0.8655	Y 0.8375	0.8078	0.7462	0.6825	0.6265	0.5764	0.5265	0.4765	Y 0.5945	Y 0.5945	Y 0.5945
	L 1.0000	0.6338	0.4914	0.3781	0.2936	0.2365	0.1777	0.1477	0.1000	-	-	-
	V -67.78	H -67.78	2.621	4.192	6.624	9.321	11.477	14.744	20.514	V -	V -	V -
	S 0.967	0.967	-37.50	-24.41	-10.85	1.70	11.25	25.52	60.51	H -	H -	H -
190	21.0890	X 0.5000	0.4246	0.2041	0.1338	0.0737	0.0472	0.0362	0.0261	X 0.8754	X 0.8754	X 0.8754
	Y 0.8617	Y 0.8228	0.8502	0.8099	0.7768	0.7053	0.6297	0.5764	0.5265	Y 0.8754	Y 0.8754	Y 0.8754
	L 1.0000	1.0000	0.5116	0.4305	0.3251	0.2277	0.1414	0.1211	0.0900	-	-	-
	V -66.66	H -66.66	-52.21	-25.25	-16.53	-2.19	13.04	27.35	49.14	H -	H -	H -
	S 0.973	0.973	1.047	1.190	1.241	1.326	1.418	1.497	1.617	H -	H -	H -
195	23.0849	X 0.5000	0.2796	0.1477	0.1021	0.0572	0.0358	0.0265	0.0263	X 0.978	X 0.978	X 0.978
	Y 0.8578	Y 1.0000	0.8226	0.7796	0.7617	0.6576	0.5669	0.5110	0.5000	Y 0.978	Y 0.978	Y 0.978
	L 1.0000	0.5941	0.4424	0.3779	0.2626	0.1260	0.0640	0.0300	0.0000	-	-	-
	V -65.54	H -65.54	2.549	4.228	5.468	8.488	12.648	16.577	16.556	H -	H -	H -
	S 0.979	0.979	-31.68	-16.80	-8.74	8.45	30.70	51.21	51.80	H -	H -	H -
200	25.950	X 0.5000	0.4339	0.1904	0.1114	0.0789	0.0441	0.0277	0.0263	X 1.1.1.	X 1.1.1.	X 1.1.1.
	Y 0.8538	Y 1.0000	0.8427	0.7935	0.7450	0.7010	0.6013	0.5000	0.4000	Y 1.1.1.	Y 1.1.1.	Y 1.1.1.
	L 1.0000	0.856	0.8382	0.4867	0.3867	0.3231	0.1819	0.0800	0.0000	-	-	-
	V -64.42	H -64.42	-51.21	-20.39	-8.84	0.05	22.27	52.57	52.57	H -	H -	H -
	S 0.984	0.984	1.051	1.213	1.279	1.331	1.455	1.615	1.818	H -	H -	H -
205	28.203	X 0.5000	0.2903	0.1387	0.0856	0.0610	0.0330	0.0201	0.0101	X 1.2.3.4.	X 1.2.3.4.	X 1.2.3.4.
	Y 0.8498	Y 1.0000	0.8138	0.7612	0.7054	0.6537	0.5344	0.4500	0.3500	Y 1.2.3.4.	Y 1.2.3.4.	Y 1.2.3.4.
	L 1.0000	0.5994	0.4196	0.3314	0.2593	0.1696	0.0696	0.0000	0.0000	-	-	-
	V -63.29	H -63.29	2.153	871	5.432	7.031	11.799	16.594	16.594	H -	H -	H -
	S 0.990	0.990	-29.75	-11.85	-0.17	1.072	41.79	52.77	52.77	H -	H -	H -

NOMENCLATURE: X = WEIGHT FRACTION UDMH IN LIQUID PHASE
 L = LB LIQUID/LB TOTAL
 H = TOTAL ENTHALPY (BTU/LB A-5C)

Y = WEIGHT FRACTION UDMH IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./LB A-5C)
 S = TOTAL ENTROPY (RTU/LB A-5C - DEC F)

Liquid-Vapor Region Temperatures Above PTP21 (For One Pound of A-50)

BUBBLE POINT PRESSURE (PSIA)		BUBBLE POINT PRESSURE: PSIA 37.000 33.000		29.000 25.000 23.000 21.000 18.000		DEW POINT PRESSURE (PSIA)					
TEMP (DEG F)	PRESS (PSIA)	X	Y	X	Y	X	Y				
210	30.610	X 0.5000		0.4043	0.1964	0.1419	0.1048	0.0661	0.0466	0.0291	X 13.777
	Y 0.8457			0.8285	0.7836	0.7569	0.7246	0.6596	0.5982	0.5000	Y
	L 1.000			0.7743	0.4830	0.4177	0.3624	0.2689	0.1781	0.000	L
	Y -62.16			-1.047	2.860	3.577	4.400	6.178	8.158	12.295	Y
215	S 0.995			-43.56	-17.62	-10.48	-3.46	10.15	24.55	53.98	H
				1.088	1.223	1.263	1.303	1.379	1.458	1.613	S
215	33.185	X 0.5000		0.4905	0.2703	0.1419	0.1068	0.0805	0.0507	0.0351	X 15.290
	Y 0.8415			0.8396	0.7983	0.7504	0.7200	0.6826	0.6061	0.5327	Y
	L 1.000			0.9727	0.5650	0.4115	0.3587	0.3032	0.1910	0.0658	L
	Y -61.03			-0.128	2.064	3.361	4.077	4.991	7.140	9.745	Y
220	S 1.001			-56.81	-24.23	-8.59	-1.90	5.94	23.31	43.77	H
				1.012	1.186	1.270	1.308	1.352	1.447	1.554	S
220	35.932	X 0.5000		0.3500	0.1851	0.1067	0.0818	0.0619	0.0383	0.0311	X 16.943
	Y 0.8373			0.8086	0.7667	0.7130	0.6776	0.6341	0.5433	0.5000	Y
	L 1.000			0.6730	0.4586	0.3512	0.2984	0.2344	0.0858	0.000	L
	Y -59.90			-1.363	2.647	3.834	4.629	5.711	8.467	10.116	Y
225	S 1.006			-32.56	-12.68	0.17	7.64	17.35	41.24	55.40	H
				1.141	1.245	1.316	1.357	1.410	1.536	1.609	S
225	38.859	X 0.5000		0.4148	0.2336	0.1344	0.0814	0.0628	0.0472	0.0321	X 18.745
	Y 0.8330			0.8156	0.7771	0.7317	0.6700	0.6290	0.5773	0.5000	Y
	L 1.000			0.7874	0.5098	0.3879	0.2886	0.2279	0.1458	0.000	L
	Y -58.76			0.797	2.099	3.092	4.364	5.306	6.665	9.198	Y
230	S 1.012			-41.16	-16.61	-3.44	10.03	15.27	32.28	56.13	H
				1.098	1.221	1.292	1.366	1.416	1.485	1.607	S
230	41.978	X 0.5000		0.2828	0.1632	0.1009	0.0624	0.0478	0.0352	0.0332	X 20.711
	Y 0.8287			0.7835	0.7433	0.6921	0.6204	0.5720	0.5106	0.5000	Y
	L 1.000			0.5663	0.4194	0.3250	0.2158	0.1373	0.0223	0.000	L
	Y -57.62			1.657	2.566	3.529	5.014	6.201	8.018	8.372	Y
230	S 1.017			-20.66	-5.99	5.89	22.06	34.48	53.20	56.86	H
				1.198	1.275	1.340	1.427	1.492	1.587	1.606	S

NOMENCLATURE: X = WEIGHT FRACTION UDMH IN LIQUID PHASE
 L = LB LIQUID/LB TOTAL
 H = TOTAL ENTHALPY (BTU/LB A-50)
 Y = WEIGHT FRACTION UDMH IN VAPOR PHASE
 V = TOTAL VOLUME (CU.FT./LB A-50)
 S = TOTAL ENTROPY (BTU/LB A-50 - DEG F)

"REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR."

A-50 VAPOR (TEMPERATURES BELOW PTP2)

V,S-V BOUNDARY				SUPERHEAT REGION TEMPERATURE: DFG F						+				-			
TEMP	PRESS	SOL ID	VAPOR	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90	-85		
-150	0.00271	V=0.0140	2.9325	3.0272	3.0745	3.1219	3.1692	3.2166	3.2639	3.3113	3.3586	3.4066	3.4533	3.4945	3.5311	3.5686	
	H -229.45	14.93	15.72	16.12	16.53	16.93	17.35	17.77	18.10	18.62	19.05	19.48	19.91	2.361	2.343	2.326	2.311
	S 0.279	2.307	2.315	2.319	2.323	2.327	2.331	2.335	2.339	2.343	2.347	2.351	2.356	2.351	2.347	2.341	2.335
-145	0.00513	V=0.0140	1.5745	1.5996	1.6246	1.6496	1.6746	1.6996	1.7246	1.7497	1.7747	1.7997	1.8247	1.8548	1.8848	1.9148	1.9448
	H -228.91	15.32	15.72	16.12	16.53	16.93	17.35	17.77	18.19	18.67	19.05	19.48	19.91	2.321	2.317	2.313	2.311
	S 0.286	2.281	2.285	2.289	2.293	2.297	2.301	2.305	2.309	2.313	2.317	2.321	2.325	2.321	2.317	2.313	2.309
-140	0.00952	V=0.0140	0.8622	0.8622	0.8757	0.8892	0.9027	0.9162	0.9297	0.9431	0.9566	0.9701	0.9836	0.9936	0.9936	0.9936	0.9936
	H -228.38	15.72	15.72	16.12	16.53	16.93	17.35	17.77	18.19	18.62	19.05	19.48	19.91	2.321	2.297	2.291	2.291
	S 0.293	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296	2.296
-135	0.01733	V=0.0140	0.4811	0.4811	0.4885	0.4959	0.5033	0.5107	0.5182	0.5255	0.5330	0.5404	0.5484	0.5530	0.5530	0.5530	0.5530
	H -227.83	16.12	16.12	16.53	16.93	17.35	17.77	18.19	18.62	19.05	19.48	19.91	19.948	2.263	2.255	2.255	2.255
	S 0.300	2.231	2.231	2.235	2.239	2.243	2.247	2.251	2.255	2.255	2.255	2.255	2.255	2.255	2.255	2.255	2.255
-130	0.03097	V=0.0140	0.2733	0.2733	0.2733	0.2775	0.2816	0.2857	0.2899	0.2946	0.2987	0.3023	0.3061	0.3061	0.3061	0.3061	0.3061
	H -227.26	16.53	16.53	16.93	17.35	17.77	18.19	18.62	19.05	19.48	19.91	19.948	19.948	2.235	2.231	2.231	2.231
	S 0.307	2.208	2.208	2.212	2.216	2.220	2.223	2.223	2.223	2.223	2.223	2.223	2.223	2.223	2.223	2.223	2.223
-125	0.05440	V=0.0140	0.1579	0.1579	0.1579	0.1603	0.1627	0.1650	0.1674	0.1697	0.1721	0.1751	0.1771	0.1771	0.1771	0.1771	0.1771
	H -226.72	16.93	16.93	16.93	16.93	17.35	17.77	18.19	18.62	19.05	19.48	19.91	19.948	2.182	2.175	2.175	2.175
	S 0.314	2.185	2.185	2.189	2.193	2.197	2.201	2.201	2.201	2.201	2.201	2.201	2.201	2.201	2.201	2.201	2.201
-120	0.09399	V=0.0140	0.0928	0.0928	0.0928	0.0941	0.0955	0.0955	0.0955	0.0955	0.0955	0.0955	0.0955	0.0955	0.0955	0.0955	0.0955
	H -226.16	17.35	17.35	17.35	17.35	17.77	18.19	18.62	19.05	19.48	19.91	19.948	19.948	2.157	2.157	2.157	2.157
	S 0.321	2.163	2.163	2.163	2.163	2.167	2.171	2.171	2.171	2.171	2.171	2.171	2.171	2.171	2.171	2.171	2.171
-115	0.15984	V=0.0140	0.0554	0.0554	0.0554	0.0562	0.0570	0.0570	0.0570	0.0570	0.0570	0.0570	0.0570	0.0570	0.0570	0.0570	0.0570
	H -225.59	17.77	17.77	17.77	17.77	17.77	18.19	18.62	19.05	19.48	19.91	19.948	19.948	2.135	2.129	2.129	2.129
	S 0.328	2.141	2.141	2.141	2.141	2.145	2.149	2.149	2.149	2.149	2.149	2.149	2.149	2.149	2.149	2.149	2.149
-110	0.26772	V=0.0140	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335	0.0335
	H -225.02	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19	18.19
	S 0.334	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121
-105	0.44195	V=0.0140	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206	0.0206
	H -224.44	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62	18.62
	S 0.341	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101	2.101
-100	0.71947	V=0.0140	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128
	H -223.86	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05
	S 0.347	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082	2.082
-95	1.15570	V=0.0140	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081
	H -223.27	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48
	S 0.354	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063	2.063

A-50 VAPOR TEMPERATURES BELOW PTP21

V-S-V BOUNDARY

TEMP	PRESS X10 (5)	SOL ID	VAPOR	SUPERHEAT REGION						-55	-50	-45	
				-90	-85	-80	-75	-70	-65				
-190	0.00271	V=0.0002	2.9325	3.5007	3.5480	3.5954	3.6427	3.6900	3.7374	3.7847	3.8321	3.8794	
	H -3.98	14.93	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.009	2.307	2.359	2.363	2.366	2.370	2.374	2.378	2.382	2.385	2.385	2.387	
-145	0.00513	V=0.0002	1.9745	1.8497	1.8747	1.8998	1.9249	1.9498	1.9748	1.9998	2.0228	2.0499	2.0749
	H -3.97	15.92	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.009	2.281	2.325	2.328	2.332	2.336	2.340	2.344	2.348	2.351	2.355	2.359	
-140	0.00952	V=0.0002	0.8622	0.9971	1.0106	1.0241	1.0375	1.0510	1.0755	1.0780	1.0975	1.1050	1.1169
	H -3.96	15.72	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.009	2.296	2.295	2.299	2.303	2.307	2.311	2.314	2.318	2.322	2.326	2.329	
-135	0.01793	V=0.0002	0.4811	0.5478	0.5552	0.5626	0.5700	0.5774	0.5848	0.5922	0.5997	0.6071	0.6145
	H -3.95	16.12	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.009	2.231	2.267	2.271	2.274	2.278	2.282	2.286	2.290	2.293	2.297	2.301	
-130	0.03097	V=0.0002	0.2733	0.3065	0.3106	0.3148	0.3189	0.3230	0.3272	0.3313	0.3355	0.3396	0.3438
	H -3.94	16.52	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.010	2.208	2.234	2.243	2.247	2.251	2.254	2.258	2.262	2.268	2.270	2.273	
-125	0.05440	V=0.0002	0.1579	0.1745	0.1768	0.1792	0.1815	0.1839	0.1863	0.1886	0.1910	0.1933	0.1957
	H -3.93	16.93	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.010	2.185	2.212	2.216	2.220	2.224	2.228	2.231	2.235	2.238	2.243	2.247	
-120	0.09399	V=0.0002	0.0928	0.1010	0.1023	0.1037	0.1051	0.1064	0.1078	0.1092	0.1105	0.1119	0.1133
	H -3.92	17.35	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.010	2.163	2.186	2.190	2.194	2.198	2.202	2.205	2.209	2.213	2.217	2.221	
-115	0.15984	V=0.0002	0.0954	0.0594	0.0602	0.0610	0.0618	0.0626	0.0634	0.0642	0.0650	0.0658	0.0666
	H -3.91	17.77	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.010	2.141	2.161	2.165	2.169	2.173	2.176	2.180	2.184	2.188	2.192	2.195	
-110	0.26772	V=0.0002	0.0335	0.0354	0.0359	0.0364	0.0369	0.0374	0.0378	0.0383	0.0393	0.0398	0.0403
	H -3.90	18.19	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.011	2.101	2.113	2.117	2.120	2.124	2.128	2.132	2.136	2.139	2.143	2.147	
-105	0.44195	V=0.0002	0.0206	0.0215	0.0218	0.0221	0.0226	0.0229	0.0232	0.0235	0.0238	0.0242	0.0248
	H -3.89	18.62	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.011	2.082	2.090	2.093	2.097	2.101	2.105	2.109	2.113	2.116	2.119	2.124	
-100	0.71947	V=0.0002	0.0126	0.0132	0.0134	0.0135	0.0137	0.0139	0.0141	0.0143	0.0144	0.0146	0.0148
	H -3.88	19.05	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.011	2.082	2.090	2.093	2.097	2.101	2.105	2.109	2.113	2.116	2.119	2.123	
-95	1.15570	V=0.0002	0.0081	0.0082	0.0083	0.0084	0.0085	0.0087	0.0088	0.0089	0.0091	0.0092	0.0093
	H -3.87	19.48	19.92	20.37	20.82	21.27	21.73	22.10	22.65	23.12	23.60	24.07	
	S 0.011	2.063	2.067	2.071	2.075	2.079	2.082	2.086	2.091	2.094	2.098	2.101	

A-50 VAPOR (TEMPERATURES BELOW PTP2)

V-S-V BOUNDARY
TEMP PRESS SOL IN VAPOR
 $\times 10^3$

				SUPERHEAT REGION TEMPERATURE: DEG F							
				-80	-75	-65	-60	-55	-50	-45	-40
-90	0.01633	V=0.0140 H -222.67 S 0.360	5.1783 19.92 2.045	5.3184 20.82 2.053	5.3884 21.27 2.057	5.5285 22.19 2.064	5.5985 22.65 2.068	5.6686 23.12 2.072	5.7386 23.60 2.076	5.8087 24.07 2.079	5.8787 24.56 2.083
-85	0.02871	V=0.0140 H -222.07 S 0.366	3.3505 20.37 2.028	3.3952 20.82 2.031	3.4399 21.27 2.035	3.5293 22.19 2.043	3.5740 22.65 2.047	3.6187 23.12 2.051	3.6634 23.60 2.054	3.7081 24.07 2.058	3.7529 24.56 2.062
-80	0.06684	V=0.0140 H -221.47 S 0.372	2.1932 20.82 2.011	2.1932 20.82 2.015	2.2798 21.27 2.022	2.3087 22.19 2.026	2.3376 22.65 2.030	2.3615 23.12 2.034	2.3954 23.60 2.037	2.4242 24.07 2.041	2.4531 24.56 2.045
-75	0.06682	V=0.0140 H -220.85 S 0.378	1.4510 21.27 1.994	1.4518 21.27 1.994	1.4895 22.19 2.002	1.5084 22.65 2.006	1.5273 23.12 2.010	1.5461 23.60 2.013	1.5650 24.07 2.017	1.5839 24.56 2.021	1.6027 25.06 2.025
-65	0.15428	V=0.0140 H -219.61 S 0.391	0.6567 22.19 1.963	0.6567 22.19 1.963	0.6651 22.65 1.967	0.6734 23.12 1.971	0.6817 23.60 1.974	0.6900 24.07 1.978	0.6983 24.56 1.982	0.7167 25.06 1.986	0.7310 25.53 1.989
-60	0.22881	V=0.0140 H -218.99 S 0.397	0.4484 22.65 1.948	0.4484 22.65 1.948	0.4541 23.12 1.952	0.4597 23.60 1.956	0.4653 24.07 1.959	0.4719 24.56 1.963	0.4765 25.06 1.967	0.4821 25.53 1.971	0.4881 25.53 1.974
-55	0.33605	V=0.0140 H -218.35 S 0.402	0.3092 23.12 1.934	0.3092 23.12 1.934	0.3130 23.60 1.937	0.3168 24.07 1.941	0.3206 24.56 1.945	0.3244 25.06 1.949	0.3283 25.53 1.952	0.3323 25.53 1.955	0.3360 25.53 1.958
-50	0.48894	V=0.0140 H -217.71 S 0.408	0.2151 23.60 1.920	0.2151 23.60 1.920	0.2177 23.60 1.920	0.2177 24.07 1.923	0.2204 24.56 1.923	0.2256 25.06 1.927	0.2295 25.53 1.931	0.2335 25.53 1.934	0.2373 25.53 1.937
-45	0.70498	V=0.0140 H -217.07 S 0.414	0.1510 24.07 1.906	0.1510 24.56 1.906	0.1510 25.06 1.906	0.1510 25.56 1.906	0.1560 26.06 1.906	0.1610 26.56 1.906	0.1667 27.06 1.910	0.1723 27.56 1.913	0.1780 28.06 1.917
-40	1.00765	V=0.0140 H -216.42 S 0.420	0.1069 24.56 1.893	0.1069 25.04 1.893	0.1069 25.54 1.893	0.1069 26.04 1.893	0.1069 26.54 1.893	0.1069 27.04 1.893	0.1129 27.54 1.897	0.1195 28.04 1.901	0.1263 28.54 1.905
-35	1.42822	V=0.0140 H -215.76 S 0.426	0.0763 25.04 1.880	0.0763 25.54 1.880	0.0763 26.04 1.880	0.0763 26.54 1.880	0.0763 27.04 1.880	0.0763 27.54 1.880	0.0763 28.04 1.884	0.0763 28.54 1.887	0.0763 29.04 1.890
-30	2.00795	V=0.0140 H -215.10 S 0.431	0.0549 25.53 1.867	0.0549 26.03 1.867	0.0549 26.53 1.867	0.0549 27.03 1.867	0.0549 27.53 1.867	0.0549 28.03 1.867	0.0549 28.53 1.867	0.0549 29.03 1.867	0.0549 29.53 1.867

A-50 VAPOR TEMPERATURES BELOW PTP2)

V-S-V BOUNDARY
TEMP PRESS SOL ID VAPOR
X10(3)

SUPERHEAT REGION TEMPERATURE: DEG F											
	-25	-20	-15	-10	-5	"	5	10	15		
-90 0.01833	V*0.0002 5.1763	6.0868	6.1568	6.2269	6.2989	6.3691	6.4390	6.5090	6.5791	6.6491	6.7191
H -3.86	19.92	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.11	30.66
S 0.011 2.045	2.094	2.098	2.102	2.105	2.109	2.113	2.116	2.120	2.124	2.127	
-85 0.02871	V*0.0002 3.3505	3.8870	3.9317	3.9764	4.0211	4.0658	4.1105	4.1552	4.1999	4.2447	4.2894
H -3.85	20.37	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.011 2.028	2.073	2.077	2.080	2.084	2.088	2.091	2.095	2.099	2.102	2.106	
-80 0.04444	V*0.0002 2.1932	2.5109	2.5398	2.5686	2.5975	2.6264	2.6553	2.6842	2.7130	2.7419	2.7708
H -3.84	20.82	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.012 2.011	2.052	2.056	2.060	2.063	2.067	2.071	2.074	2.078	2.081	2.085	
-75 0.06802	V*0.0002 1.4518	1.6405	1.6594	1.6782	1.6971	1.7160	1.7348	1.7537	1.7724	1.7912	1.8103
H -3.83	21.27	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.012 1.994	2.032	2.036	2.039	2.043	2.047	2.051	2.054	2.058	2.061	2.065	
-65 0.15428	V*0.0002 0.6567	0.7233	0.7316	0.7399	0.7483	0.7666	0.7649	0.7732	0.7815	0.7899	0.7982
H -3.81	22.19	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.012 1.963	1.993	1.997	2.000	2.004	2.008	2.011	2.015	2.019	2.022	2.026	
-60 0.22801	V*0.0002 0.4484	0.4877	0.4933	0.4989	0.5045	0.5102	0.5158	0.5214	0.5270	0.5326	0.5382
H -3.80	22.65	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.012 1.948	1.974	1.978	1.982	1.985	1.989	1.993	1.996	2.000	2.004	2.007	
-55 0.33605	V*0.0002 0.3092	0.3321	0.3359	0.3397	0.3435	0.3474	0.3512	0.3550	0.3588	0.3626	0.3665
H -3.78	23.12	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.013 1.934	1.956	1.960	1.963	1.967	1.971	1.974	1.978	1.982	1.985	1.989	
-50 0.48894	V*0.0002 0.2151	0.2282	0.2309	0.2335	0.2361	0.2387	0.2414	0.2440	0.2466	0.2519	
H -3.77	23.60	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.013 1.920	1.938	1.942	1.946	1.949	1.953	1.957	1.960	1.964	1.967	1.971	
-45 0.70498	V*0.0002 0.1510	0.1583	0.1601	0.1616	0.1638	0.1656	0.1674	0.1692	0.1710	0.1720	0.1747
H -3.76	24.07	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.013 1.906	1.921	1.925	1.928	1.932	1.936	1.939	1.943	1.946	1.949	1.954	
-40 1.00765	V*0.0002 0.1069	0.1107	0.1120	0.1133	0.1146	0.1158	0.1171	0.1184	0.1197	0.1208	0.1222
H -3.75	24.56	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.013 1.893	1.904	1.908	1.911	1.915	1.919	1.922	1.926	1.929	1.932	1.937	
-35 1.42822	V*0.0002 0.0763	0.0781	0.0790	0.0799	0.0808	0.0817	0.0826	0.0835	0.0844	0.0851	0.0862
H -3.74	25.04	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.013 1.880	1.887	1.891	1.895	1.899	1.902	1.906	1.909	1.912	1.915	1.918	
-30 2.00795	V*0.0002 0.0549	0.0556	0.0562	0.0569	0.0575	0.0581	0.0588	0.0594	0.0598	0.0601	0.0604
H -3.73	25.53	26.03	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.66
S 0.013 1.867	1.871	1.875	1.878	1.881	1.885	1.889	1.892	1.895	1.897	1.900	

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~~REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR~~

A-5C VAPOR TEMPERATURES BELOW PTP21

V-S-V BOUNDARY		SUPERHEAT REGION												
TEMP	PRESS X10 ¹²	SOLID	VAPOR	TEMPERATURE F: DEG F	-15	-10	-5	0	5	10	15	20	25	30
-25	0.28010	V=0.0140	3.9841	4.0758	4.1216	4.1674	4.2133	4.2591	4.3049	4.3508	4.3966	4.4424	4.4882	
	H -214.43	26.03	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.64	31.20	31.73		
	S 0.437	1.863	1.863	1.866	1.870	1.874	1.877	1.881	1.884	1.888	1.892	1.895		
-20	0.38777	V=0.0140	2.9109	2.9440	2.9771	3.0103	3.0434	3.0765	3.1096	3.1427	3.1758	3.2089	3.2420	
	H -213.76	26.53	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.64	31.20	31.73		
	S 0.442	1.843	1.847	1.851	1.854	1.858	1.862	1.865	1.869	1.873	1.876	1.880		
-15	0.53292	V=0.0140	2.1422	2.1422	2.1663	2.1904	2.2144	2.2365	2.2626	2.2867	2.3108	2.3340	2.3589	
	H -213.08	27.03	27.03	27.54	28.05	28.56	29.08	29.60	30.13	30.64	31.20	31.73		
	S 0.448	1.832	1.832	1.836	1.839	1.843	1.847	1.850	1.854	1.857	1.861	1.865		
-10	0.72725	V=0.0140	1.5874	1.6051	1.6227	1.6404	1.6580	1.6757	1.6933	1.7110	1.7286			
	H -212.39	27.54	27.54	27.54	28.05	28.56	29.08	29.60	30.13	30.64	31.20	31.73		
	S 0.453	1.821	1.821	1.825	1.828	1.832	1.835	1.839	1.843	1.846	1.850			
-5	0.98967	V=0.0140	1.1843	1.1843	1.1973	1.2103	1.2233	1.2363	1.2494	1.2624	1.2754			
	H -211.70	28.05	28.05	28.56	29.08	29.60	30.13	30.64	31.20	31.73				
	S 0.459	1.810	1.810	1.811	1.817	1.821	1.825	1.829	1.832	1.837	1.835			
0	1.32712	V=0.0140	0.8892	0.8892	0.8892	0.8892	0.8892	0.9086	0.9183	0.9279	0.9376	0.9473		
	H -211.01	28.56	28.56	28.56	29.08	29.60	30.13	30.64	31.20	31.73				
	S 0.464	1.800	1.800	1.803	1.807	1.811	1.814	1.818	1.821					
5	1.77540	V=0.0140	0.6719	0.6719	0.6792	0.6864	0.6936	0.7009						
	H -210.31	29.08	29.08	29.60	30.13	30.64	31.20	31.73						
	S 0.470	1.789	1.789	1.793	1.797	1.801	1.805	1.809	1.813	1.817	1.821	1.825		
10	2.36051	V=0.0140	0.5108	0.5108	0.5168	0.5217	0.5271	0.5326						
	H -209.60	29.60	29.60	29.60	30.13	30.64	31.20	31.73						
	S 0.475	1.780	1.780	1.783	1.787	1.791	1.795	1.800	1.804	1.808	1.812	1.816		
15	3.11967	V=0.0140	0.3906	0.3906	0.3906	0.3947	0.3989	0.4030						
	H -208.89	30.13	30.13	30.13	30.13	30.64	31.20	31.73						
	S 0.480	1.770	1.770	1.773	1.777	1.781	1.785	1.789	1.793	1.797	1.801	1.805		
20	4.09908	V=0.0140	0.3004	0.3004	0.3004	0.3047	0.3089	0.3130						
	H -207.45	31.20	31.20	31.20	31.20	31.66	32.20	32.73						
	S 0.491	1.761	1.761	1.764	1.767	1.770	1.773	1.776	1.780	1.784	1.788	1.792		
25	5.35511	V=0.0140	0.2324	0.2324	0.2324	0.2366	0.2408	0.2450						
	H -206.72	31.73	31.73	31.73	31.73	32.19	32.73	33.26						
	S 0.496	1.743	1.743	1.746	1.749	1.752	1.755	1.758	1.761	1.764	1.767	1.770		

1...50 VAPOR TEMPERATURES BELOW PTP 2)

V-S-V BOUNDARY

TEMP X10(1/2)	PRESS X10(1/2)	SOLID	VAPOR	SUPERHEAT REGION									
				35	40	45	50	55	60	65	70	75	
-25	0.28010	V=0.0002	3.9441	4.5340	4.5799	4.6257	4.6715	4.7173	4.7632	4.8090	4.8548	4.9006	4.9465
	H -3.72	26.03	32.26	32.87	32.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.014	1.695	1.899	1.902	1.906	1.909	1.913	1.917	1.920	1.924	1.927	1.931	
-20	0.30777	V=0.0002	2.9109	3.2751	3.3082	3.3413	3.3744	3.4074	3.4406	3.4737	3.5068	3.5495	3.5930
	H -3.71	26.53	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.016	1.693	1.883	1.887	1.890	1.894	1.898	1.901	1.905	1.908	1.912	1.915	
-15	0.32292	V=0.0002	2.1422	2.3630	2.4071	2.4317	2.4553	2.4794	2.5035	2.5275	2.5516	2.5757	2.5998
	H -3.69	27.03	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.014	1.692	1.882	1.872	1.874	1.879	1.882	1.886	1.890	1.893	1.896	1.900	
-10	0.72725	V=0.0002	1.9874	1.7463	1.7639	1.7816	1.7992	1.8169	1.8345	1.8522	1.8795	1.8975	1.9051
	H -3.68	27.54	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.014	1.691	1.881	1.885	1.887	1.891	1.894	1.898	1.901	1.905	1.908	1.915	
-5	0.98567	V=0.0002	1.1863	1.2884	1.3014	1.3145	1.3275	1.3405	1.3535	1.3666	1.3796	1.3926	1.4056
	H -3.67	26.05	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.014	1.690	1.880	1.889	1.893	1.896	1.899	1.903	1.907	1.910	1.914	1.918	
0	1.32712	V=0.0002	0.9892	0.9569	0.9666	0.9763	0.9859	0.9956	1.0053	1.0155	1.0246	1.0342	1.0440
	H -3.66	26.56	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.014	1.689	1.879	1.885	1.888	1.892	1.896	1.900	1.904	1.908	1.912	1.917	
5	1.77540	V=0.0002	0.6719	0.7153	0.7225	0.7298	0.7370	0.7442	0.7515	0.7597	0.7659	0.7731	0.7804
	H -3.65	29.08	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.015	1.789	1.881	1.885	1.889	1.893	1.897	1.901	1.905	1.909	1.913	1.917	
10	2.36051	V=0.0002	0.5106	0.5380	0.5434	0.5489	0.5543	0.5598	0.5652	0.5706	0.5761	0.5895	0.5964
	H -3.63	29.60	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.015	1.780	1.797	1.801	1.805	1.808	1.812	1.815	1.819	1.822	1.826	1.829	
15	3.11967	V=0.0002	0.3906	0.4071	0.4112	0.4153	0.4194	0.4235	0.4277	0.4318	0.4350	0.4400	0.4461
	H -3.62	30.13	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.015	1.770	1.784	1.788	1.791	1.795	1.798	1.802	1.805	1.809	1.812	1.816	
20	4.09908	V=0.0002	0.3004	0.3098	0.3129	0.3161	0.3192	0.3223	0.3255	0.3286	0.3317	0.3343	0.3386
	H -3.61	30.66	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.015	1.761	1.771	1.775	1.778	1.782	1.785	1.789	1.792	1.796	1.799	1.803	
25	5.35511	V=0.0002	0.2324	0.2372	0.2395	0.2419	0.2443	0.2467	0.2491	0.2515	0.2539	0.2567	0.2617
	H -3.60	31.20	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.015	1.751	1.759	1.762	1.766	1.770	1.773	1.776	1.779	1.783	1.787	1.790	
30	6.95869	V=0.0002	0.1807	0.1825	0.1843	0.1862	0.1880	0.1899	0.1917	0.1935	0.1952	0.1972	0.1991
	H -3.58	31.73	32.26	32.87	33.37	33.93	34.49	35.05	35.61	36.18	36.76	37.33	
	S 0.015	1.743	1.746	1.750	1.753	1.757	1.760	1.764	1.767	1.771	1.774	1.778	

A-50 VAPOR TEMPERATURES ABOVE PTP21

DEW POINT TEMP	PRESS COMP.	LIQUID		VAPOR	SUPERHEAT REGION TEMPERATURE: 40°		50	55	60	65	70	75	80	85	90
		L	V		L	V									
35	0.094	0.0068	V	0.016	1.350	1.36406	1.37771	1.39136	1.40500	1.41865	1.44595	1.47324	1.50054		
			N	-197.5	32.28	32.83	33.38	33.93	34.49	35.05	36.19	37.34	38.51		
			S	0.786	1.732	1.735	1.739	1.743	1.746	1.750	1.757	1.764	1.771		
40	0.114	0.0072	V	0.016	1.127	1.12698	1.13826	1.14953	1.16081	1.17208	1.19464	1.21738	1.23974		
			N	-155.6	32.83	32.83	33.38	33.93	34.49	35.05	36.19	37.34	38.51		
			S	0.798	1.726	1.726	1.730	1.733	1.737	1.741	1.748	1.755	1.761		
45	0.137	0.0075	V	0.016	0.943	0.94324	0.95259	0.96193	0.97128	0.98996	0.99837	1.00843	1.02734		
			N	-154.1	33.38	33.38	33.94	33.94	34.49	35.06	36.19	37.34	38.51		
			S	0.809	1.721	1.721	1.725	1.725	1.728	1.732	1.739	1.746	1.753		
50	0.165	0.0080	V	0.016	0.792	0.79177	0.79954	0.80731	0.82284	0.83837	0.85391				
			N	-152.3	33.94	33.94	33.94	33.94	34.49	35.06	36.19	37.34	38.51		
			S	0.821	1.716	1.716	1.716	1.716	1.719	1.723	1.730	1.737	1.744		
55	0.198	0.0084	V	0.016	0.668	0.66802	0.67451	0.68749	0.70047	0.71344	0.72642	0.73940	0.75237		
			N	-150.6	34.50	34.50	34.50	34.50	34.50	35.06	36.19	37.34	38.51		
			S	0.832	1.711	1.711	1.711	1.711	1.714	1.721	1.728	1.735			
60	0.236	0.0088	V	0.016	0.565	0.56514	0.57601	0.58645	0.59774	0.60845	0.62001	0.63033	0.64068	0.65098	
			N	-149.9	35.06	35.06	35.06	35.06	35.06	36.19	37.34	38.51			
			S	0.843	1.706	1.706	1.706	1.706	1.706	1.713	1.720	1.727			
65	0.280	0.0092	V	0.016	0.480	0.48000	0.49000	0.50000	0.51000	0.52000	0.53000	0.54000	0.55000	0.56000	
			N	-147.1	35.63	35.63	35.63	35.63	35.63	36.20	37.34	38.51			
			S	0.854	1.701	1.701	1.701	1.701	1.705	1.712	1.719				
70	0.332	0.0097	V	0.016	0.409	0.40900	0.42000	0.43000	0.44000	0.45000	0.46000	0.47000	0.48000	0.49000	
			N	-145.4	36.20	36.20	36.20	36.20	36.20	36.20	36.20	37.34	38.51		
			S	0.865	1.697	1.697	1.697	1.697	1.697	1.704	1.711	1.718			
75	0.392	0.0101	V	0.016	0.351	0.35100	0.36200	0.37300	0.38400	0.39500	0.40604	0.41704	0.42477		
			N	-143.6	36.77	36.77	36.77	36.77	36.77	36.77	36.77	37.34	38.51		
			S	0.876	1.692	1.692	1.692	1.692	1.692	1.692	1.692	1.698	1.703		
80	0.461	0.0106	V	0.016	0.300	0.30000	0.31000	0.32000	0.33000	0.34000	0.35000	0.36004	0.37004	0.38004	
			N	-141.9	37.35	37.35	37.35	37.35	37.35	37.35	37.35	37.35	38.52		
			S	0.887	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.695		
85	0.562	0.0111	V	0.016	0.258	0.25800	0.26800	0.27800	0.28800	0.29800	0.30800	0.31800	0.32800	0.33800	
			N	-140.1	37.94	37.94	37.94	37.94	37.94	37.94	37.94	37.94	38.52		
			S	0.897	1.684	1.684	1.684	1.684	1.684	1.684	1.684	1.684	1.687		
90	0.634	0.0117	V	0.016	0.222	0.22200	0.23200	0.24200	0.25200	0.26200	0.27200	0.28200	0.29200	0.30200	
			N	-138.3	38.52	38.52	38.52	38.52	38.52	38.52	38.52	38.52	38.52		
			S	0.907	1.680	1.680	1.680	1.680	1.680	1.680	1.680	1.680	1.680		

A-50 VAPOR TEMPERATURES ABOVE PTP21

DEN POINT TEMP PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION TEMPERATURE: 95 100 105 110 115 120 125 130							
				1.51420	1.52785	1.54150	1.55515	1.56879	1.58244	1.59609	1.60974
35 0.054 0.0068	V*	0.016	H -197.5	32.26	39.09	40.26	40.86	41.49	42.09	42.70	43.32
	S 0.786	1.732	1.774	1.777	1.781	1.784	1.786	1.791	1.795	1.798	
40 0.114 0.0072	V*	0.016	H -195.8	32.83	39.10	39.69	40.26	40.86	41.49	42.09	42.70
	S 0.798	1.726	1.765	1.768	1.772	1.775	1.779	1.782	1.785	1.789	
45 0.137 0.0075	V*	0.016	H -194.1	33.36	39.10	39.69	40.26	40.86	41.49	42.09	42.70
	S 0.809	1.721	1.756	1.759	1.763	1.766	1.770	1.773	1.776	1.780	
50 0.165 0.0080	V*	0.016	H -192.3	33.94	39.10	39.69	40.29	40.88	41.49	42.09	42.71
	S 0.821	1.716	1.747	1.751	1.754	1.757	1.761	1.764	1.768	1.771	
55 0.198 0.0084	V*	0.016	H -190.6	34.50	39.10	39.69	40.29	40.88	41.49	42.10	42.71
	S 0.832	1.711	1.739	1.742	1.746	1.749	1.752	1.756	1.759	1.763	
60 0.236 0.0088	V*	0.016	H -148.9	35.06	39.10	39.69	40.29	40.89	41.49	42.10	42.71
	S 0.843	1.706	1.730	1.734	1.737	1.741	1.744	1.747	1.751	1.754	
65 0.280 0.0092	V*	0.016	H -147.1	35.63	39.10	39.69	40.29	40.89	41.49	42.10	42.71
	S 0.854	1.701	1.722	1.725	1.729	1.732	1.736	1.739	1.743	1.746	
70 0.332 0.0097	V*	0.016	H -145.4	36.20	39.10	39.69	40.29	40.89	41.49	42.10	42.71
	S 0.865	1.697	1.714	1.717	1.721	1.724	1.728	1.731	1.734	1.738	
75 0.392 0.0101	V*	0.016	H -143.6	36.77	39.10	39.70	40.29	40.89	41.50	42.10	42.71
	S 0.876	1.692	1.706	1.710	1.713	1.716	1.720	1.723	1.727	1.730	
80 0.461 0.0106	V*	0.016	H -141.9	37.35	39.11	39.70	40.29	40.89	41.50	42.10	42.71
	S 0.887	1.688	1.698	1.702	1.705	1.709	1.712	1.715	1.719	1.722	
85 0.542 0.0111	V*	0.016	H -140.1	37.94	39.11	39.70	40.30	40.90	41.50	42.11	42.72
	S 0.897	1.684	1.691	1.694	1.698	1.701	1.704	1.708	1.711	1.715	
90 0.634 0.0117	V*	0.016	H -138.3	38.52	39.11	39.70	40.30	40.90	41.50	42.11	42.72
	S 0.907	1.680	1.683	1.687	1.691	1.695	1.699	1.703	1.706	1.707	

DEW POINT TEMP	PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION								
					100	105	110	115	120	130	140	150	
95	0.141	0.0122	V	0.016	1.920	1.93764	1.95500	1.97236	1.98972	2.00708	2.04180	2.07651	2.11329
	H	-136.5	39.12	39.71	40.30	40.90	41.51	42.11	43.34	44.58	45.83		
	S	0.918	1.676	1.679	1.683	1.686	1.690	1.693	1.700	1.706	1.713		
100	0.862	0.0127	V	0.016	1.664	1.66401	1.67892	1.69384	1.70875	1.72367	1.75349	1.78332	1.81314
	H	-134.8	39.71	39.71	40.31	40.91	41.51	42.12	43.34	44.58	45.83		
	S	0.928	1.672	1.672	1.675	1.679	1.682	1.686	1.692	1.699	1.706		
105	1.001	0.0133	V	0.016	1.446	1.44653	1.45838	1.47123	1.48408	1.50977	1.53547	1.56116	
	H	-133.0	40.31	40.31	40.91	41.51	42.12	43.35	44.58	45.84			
	S	0.938	1.668	1.668	1.668	1.672	1.675	1.679	1.685	1.692	1.699		
110	1.160	0.0138	V	0.016	1.259	1.259	1.25977	1.26987	1.28097	1.30316	1.32535	1.34753	
	H	-131.2	40.92	40.92	40.92	41.52	42.13	43.35	44.59	45.84			
	S	0.947	1.665	1.665	1.665	1.666	1.668	1.672	1.678	1.685	1.692		
115	1.340	0.0144	V	0.016	1.099	1.099	1.09978	1.10978	1.10839	1.12761	1.14682	1.16603	
	H	-129.3	41.53	41.53	41.53	41.53	42.13	43.36	44.58	45.85			
	S	0.957	1.661	1.661	1.661	1.661	1.661	1.665	1.671	1.678	1.685		
120	1.545	0.0150	V	0.016	0.961	0.961	0.96136	0.96136	0.96136	0.97804	0.99421	1.01139	
	H	-127.5	42.14	42.14	42.14	42.14	42.14	43.36	44.58	45.85			
	S	0.967	1.658	1.658	1.658	1.658	1.658	1.665	1.671	1.678			
125	1.776	0.0157	V	0.016	0.843	0.843	0.843	0.843	0.85031	0.86482	0.87933		
	H	-125.7	42.76	42.76	42.76	42.76	42.76	43.37	44.58	45.86			
	S	0.976	1.655	1.655	1.655	1.655	1.655	1.658	1.665	1.672			
130	2.036	0.0163	V	0.016	0.741	0.741	0.741	0.741	0.74137	0.75403	0.76670		
	H	-123.9	43.38	43.38	43.38	43.38	43.38	43.38	44.62	45.87			
	S	0.986	1.652	1.652	1.652	1.652	1.652	1.652	1.658	1.665			
135	2.329	0.0169	V	0.017	0.653	0.653	0.653	0.653	0.653	0.653	0.653	0.66997	
	H	-122.0	44.00	44.00	44.00	44.00	44.00	44.00	44.62	45.88			
	S	0.995	1.648	1.648	1.648	1.648	1.648	1.648	1.652	1.659			
140	2.660	0.0176	V	0.017	0.577	0.577	0.577	0.577	0.577	0.577	0.577	0.58663	
	H	-120.2	44.63	44.63	44.63	44.63	44.63	44.63	44.63	45.89			
	S	1.004	1.646	1.646	1.646	1.646	1.646	1.646	1.646	1.652			
145	3.029	0.0183	V	0.017	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.51466	
	H	-118.3	45.27	45.27	45.27	45.27	45.27	45.27	45.27	45.90			
	S	1.013	1.643	1.643	1.643	1.643	1.643	1.643	1.643	1.646			
150	3.443	0.0190	V	0.017	0.453	0.453	0.453	0.453	0.453	0.453	0.453	0.45261	
	H	-116.5	45.91	45.91	45.91	45.91	45.91	45.91	45.91	45.91			
	S	1.022	1.640	1.640	1.640	1.640	1.640	1.640	1.640	1.640			

• VAPOR VOLUME TIMES 10⁶ -21

"REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR"

A-50 VAPOR TEMPERATURES ABOVE PTP21

DEW POINT TEMP PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION						
				155	160	165	170	175	180	185
95 0.741 0.0122	V# 0.016 H# -136.5 S# 0.918	1.920 39.12 1.676	2.13063 46.46 1.717	2.14796 47.10 1.720	2.16529 47.74 1.723	2.18262 48.38 1.727	2.19995 49.03 1.730	2.21728 49.67 1.733	2.23461 50.32 1.736	2.25194 50.98 1.740
100 0.862 0.0127	V# 0.016 H# -134.8 S# 0.928	1.664 39.71 1.672	1.82806 46.47 1.709	1.84297 47.10 1.713	1.85788 47.74 1.716	1.87279 48.38 1.719	1.88770 49.03 1.723	1.90261 49.68 1.726	1.91942 50.32 1.729	1.93430 50.99 1.733
105 1.001 0.0133	V# 0.016 H# -133.0 S# 0.938	1.446 40.31 1.668	1.57401 46.47 1.702	1.58686 47.11 1.706	1.59970 47.74 1.709	1.61254 48.39 1.712	1.62539 49.03 1.715	1.63823 49.68 1.719	1.65107 50.32 1.722	1.66391 50.99 1.725
110 1.160 0.0138	V# 0.016 H# -131.2 S# 0.947	1.259 40.92 1.665	1.35864 46.47 1.695	1.36973 47.11 1.699	1.38082 47.75 1.702	1.39191 48.39 1.705	1.40300 49.04 1.708	1.41409 49.69 1.712	1.42519 50.34 1.715	1.43627 51.00 1.718
115 1.340 0.0144	V# 0.016 H# -129.3 S# 0.957	1.099 41.53 1.661	1.17564 46.48 1.688	1.18524 47.11 1.692	1.19485 47.75 1.695	1.20445 48.40 1.698	1.21406 49.04 1.702	1.22366 49.69 1.705	1.23326 50.34 1.708	1.24286 51.00 1.712
120 1.545 0.0150	V# 0.016 H# -127.5 S# 0.967	961 42.14 1.658	1.01973 46.49 1.682	1.02807 47.12 1.685	1.03660 47.76 1.688	1.04674 48.40 1.692	1.05307 49.05 1.695	1.06141 49.69 1.698	1.06924 50.35 1.701	1.07807 51.01 1.705
125 1.776 0.0157	V# 0.016 H# -125.7 S# 0.976	863 42.76 1.655	88659 46.49 1.675	89364 47.13 1.678	90110 47.77 1.682	90835 48.41 1.685	91560 49.05 1.688	92285 49.69 1.691	93010 50.36 1.695	93735 51.01 1.698
130 2.036 0.0163	V# 0.016 H# -123.9 S# 0.986	741 43.38 1.652	77303 46.50 1.668	77936 47.14 1.672	78569 47.77 1.675	79202 48.41 1.678	79835 49.05 1.682	80467 49.69 1.685	81100 50.36 1.688	81733 51.02 1.692
135 2.329 0.0169	V# 0.017 H# -122.0 S# 0.995	653 44.00 1.648	67551 46.51 1.662	68105 47.14 1.665	68658 47.78 1.669	69212 48.42 1.672	69766 49.05 1.675	70319 49.69 1.679	70872 50.37 1.682	71426 51.03 1.685
140 2.660 0.0176	V# 0.017 H# -120.2 S# 1.004	577 44.63 1.646	59128 46.52 1.656	59614 47.15 1.659	60099 47.79 1.662	60584 48.43 1.666	61069 49.05 1.669	61554 49.69 1.672	62039 50.38 1.676	62524 51.04 1.679
145 3.029 0.0183	V# 0.017 H# -118.3 S# 1.013	510 45.27 1.643	51893 46.53 1.653	52319 47.16 1.653	52745 47.80 1.656	53171 48.44 1.659	53598 49.09 1.663	54024 49.74 1.666	54450 50.39 1.669	54876 51.05 1.673
150 3.443 0.0190	V# 0.017 H# -116.5 S# 1.022	453 45.91 1.640	45637 46.54 1.643	46012 47.18 1.647	46388 47.81 1.650	46763 48.46 1.653	47138 49.10 1.657	47513 49.75 1.660	47889 50.40 1.663	48264 51.06 1.666

D-47

DEW POINT: TEMP PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION: TEMPERATURE: 160 165						175	180	190	200	210
				160	165	170	175	180	190					
906 0.0197	V* 0.017 H -114.6 S 1.031	4.020 46.56 1.637	4.05266 47.19 1.644	4.08578 47.83 1.647	4.11869 48.47 1.651	4.15199 49.11 1.654	4.18509 49.76 1.660	4.225128 51.07 1.667	4.31746 52.39 1.674	4.38362 53.73				
21 0.0205	V* 0.017 H -112.7 S 1.040	3.579 47.21 1.635	3.57958 47.84 1.638	3.60787 48.48 1.641	3.63716 49.13 1.645	3.66644 49.78 1.648	3.69571 51.09 1.655	3.75426 51.09 1.661	3.81279 52.41 1.666	3.87130 53.74 1.668				
.995 0.0212	V* 0.017 H -110.9 S 1.048	3.191 47.86 1.632	3.19070 47.86 1.632	3.21664 48.50 1.635	3.24259 49.15 1.639	3.26893 49.79 1.642	3.3039 51.10 1.649	3.32039 51.10 1.655	3.37224 52.42 1.662	3.42408 53.76 1.666				
-71 5.631 0.0220	V* 0.017 H -109.0 S 1.057	2.051 48.92 1.630	2.05136 48.92 1.630	2.05136 49.52 1.633	2.05136 49.16 1.636	2.05136 49.81 1.638	2.05136 51.12 1.643	2.04351 52.44 1.649	2.08957 52.44 1.656	3.03561 53.77 1.656				
175 6.337 0.0228	V* 0.017 H -107.1 S 1.065	2.552 49.18 1.627	2.552 49.18 1.627	2.552 49.18 1.627	2.55180 49.18 1.631	2.55180 49.83 1.631	2.55180 51.14 1.637	2.61329 51.14 1.644	2.65426 52.46 1.650	2.69522 53.79 1.650				
180 7.118 0.0237	V* 0.017 H -105.2 S 1.074	2.288 49.85 1.625	2.288 49.85 1.625	2.288 49.85 1.625	2.288 49.85 1.625	2.288 49.85 1.625	2.288 51.18 1.632	2.32441 51.18 1.637	2.36084 52.48 1.645	2.39742 53.81 1.645				
185 7.980 0.0245	V* 0.017 H -103.3 S 1.082	2.055 50.53 1.623	2.055 50.53 1.623	2.055 50.53 1.623	2.055 50.53 1.623	2.055 50.53 1.623	2.055 51.18 1.626	2.07116 51.18 1.632	2.10380 52.50 1.639	2.13642 53.84 1.639				
190 8.930 0.0254	V* 0.017 H -101.3 S 1.090	1.849 51.21 1.621	1.849 51.21 1.621	1.849 51.21 1.621	1.849 51.21 1.621	1.849 51.21 1.621	1.849 51.21 1.621	1.84876 51.21 1.621	1.87798 52.53 1.627	1.90718 53.86 1.634				
195 9.978 0.0263	V* 0.017 H -99.4 S 1.098	1.666 51.90 1.619	1.666 51.90 1.619	1.666 51.90 1.619	1.666 51.90 1.619	1.666 51.90 1.619	1.666 51.90 1.619	1.67871 51.21 1.622	1.87798 52.56 1.622	1.90718 53.89 1.628				
200 11.130 0.0272	V* 0.017 H -97.5 S 1.106	1.503 52.59 1.617	1.503 52.59 1.617	1.503 52.59 1.617	1.503 52.59 1.617	1.503 52.59 1.617	1.503 52.59 1.617	1.50311 52.59 1.617	1.52664 53.92 1.623	1.58311 53.96 1.623				
205 12.391 0.0281	V* 0.017 H -95.5 S 1.114	1.359 53.29 1.615	1.359 53.29 1.615	1.359 53.29 1.615	1.359 53.29 1.615	1.359 53.29 1.615	1.359 53.29 1.615	1.36928 53.96 1.616	1.422975 53.99 1.613	1.48928 53.99 1.613				
210 13.776 0.0291	V* 0.017 H -93.6 S 1.122	1.230 53.99 1.613	1.230 53.99 1.613	1.230 53.99 1.613	1.230 53.99 1.613	1.230 53.99 1.613	1.230 53.99 1.613	1.230 53.99 1.613	1.29742 53.99 1.613	1.36928 53.99 1.613				

A-50 VAPOR (TEMPERATURES ABOVE PTP2)

DEW POINT TEMP	LIQUID PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION TEMPERATURE: 215 220					
					225	230	235	240	245	250
155 3.906 0.0197	V# 0.017	4.020	4.41672	4.44979	4.48286	4.51593	4.54899	4.58205	4.61511	4.64817
H -114.6	46.56	54.40	55.06	55.76	56.44	57.13	57.82	58.51	59.20	
S 1.C31	1.637	1.677	1.680	1.683	1.686	1.690	1.693	1.696	1.699	
160 4.421 0.0205	V# 0.017	3.979	3.90057	3.92982	3.95907	3.98031	4.01755	4.04678	4.07602	4.10525
H -112.7	47.21	54.41	55.09	55.77	56.45	57.14	57.83	58.52	59.22	
S 1.040	1.635	1.671	1.674	1.677	1.681	1.684	1.687	1.690	1.693	
165 4.995 0.0212	V# 0.017	3.191	3.45002	3.47593	3.50183	3.52774	3.55364	3.57954	3.60543	3.63132
H -110.9	47.86	54.43	55.11	55.79	56.47	57.15	57.84	58.53	59.23	
S 1.048	1.632	1.665	1.668	1.671	1.675	1.678	1.681	1.684	1.688	
170 5.631 0.0220	V# 0.017	2.851	3.05864	3.08165	3.10466	3.12766	3.15067	3.17367	3.19666	3.21965
H -109.0	48.52	54.45	55.12	55.80	56.48	57.17	57.86	58.55	59.25	
S 1.057	1.630	1.659	1.663	1.666	1.669	1.672	1.675	1.679	1.682	
175 6.337 0.0228	V# 0.017	2.552	2.71571	2.73618	2.75665	2.77711	2.79757	2.81803	2.83849	2.85894
H -107.1	49.18	54.47	55.14	55.82	56.50	57.19	57.88	58.57	59.26	
S 1.065	1.627	1.654	1.657	1.660	1.663	1.667	1.670	1.673	1.676	
D-49			2.41572	2.43397	2.45221	2.47046	2.48864	2.50693	2.52517	2.54339
180 7.118 0.0237	V# 0.017	2.288	54.49	55.16	55.84	56.52	57.21	57.90	58.59	59.28
H -105.2	49.85	54.51	55.18	55.86	56.54	57.23	57.92	58.61	59.30	
S 1.074	1.625	1.648	1.651	1.654	1.658	1.661	1.664	1.667	1.671	
185 7.980 0.0245	V# 0.017	2.055	2.15274	2.16904	2.18534	2.20163	2.21792	2.23421	2.25049	2.26678
H -103.3	50.53	54.53	55.16	55.84	56.52	57.21	57.90	58.59	59.28	
S 1.082	1.623	1.642	1.646	1.649	1.652	1.655	1.659	1.662	1.665	
190 8.930 0.0254	V# 0.017	1.849	1.92179	1.93638	1.95096	1.96555	1.98013	1.99471	2.00928	2.02385
H -101.3	51.21	54.53	55.21	55.89	56.57	57.25	57.94	58.63	59.33	
S 1.090	1.621	1.637	1.640	1.644	1.647	1.650	1.653	1.656	1.660	
195 9.978 0.0263	V# 0.017	1.666	1.71798	1.73107	1.74415	1.75722	1.77029	1.78336	1.79643	1.80949
H -99.4	51.90	54.56	55.24	55.92	56.60	57.28	57.97	58.66	59.35	
S 1.098	1.619	1.632	1.635	1.638	1.641	1.645	1.648	1.651	1.654	
200 11.130 0.0272	V# 0.017	1.503	1.53840	1.55015	1.56190	1.57365	1.58539	1.59713	1.60887	1.62060
H -97.5	52.59	54.59	55.27	55.95	56.63	57.31	58.00	58.69	59.38	
S 1.106	1.617	1.626	1.630	1.633	1.636	1.639	1.643	1.646	1.649	
205 12.391 0.0281	V# 0.017	1.359	1.37987	1.39045	1.40103	1.41160	1.42217	1.43274	1.44330	1.45386
H -95.5	53.29	54.63	55.30	55.98	56.66	57.34	58.03	58.72	59.42	
S 1.114	1.615	1.621	1.624	1.628	1.631	1.634	1.637	1.641	1.644	
210 13.776 0.0291	V# 0.017	1.230	1.23930	1.24864	1.25838	1.26791	1.27744	1.28697	1.29649	1.30601
H -93.6	53.99	54.66	55.34	56.01	56.70	57.38	58.07	58.76	59.45	
S 1.122	1.613	1.616	1.619	1.623	1.626	1.629	1.632	1.635	1.639	

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A-50 VAPOR (TEMPERATURES ABOVE PTP2)

DEW POINT TEMP	PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION								
					220	225	230	235	240	250	260		
215	15.290	0.0300	V*	0.017	1.115	1.12335	1.13197	1.14058	1.14919	1.15779	1.17499	1.19218	1.20936
	H	-91.6	54.71	55.38	56.05	56.73	57.42	58.10	59.49	60.88	62.29		
	S	1.130	1.611	1.614	1.617	1.621	1.624	1.627	1.634	1.640	1.646		
220	16.943	0.0311	V*	0.017	1.012	1.01198	1.01978	1.02758	1.03537	1.04318	1.05872	1.07428	1.08982
	H	-89.6	55.42	55.42	56.10	56.78	57.46	58.18	59.53	60.93	62.33		
	S	1.130	1.609	1.609	1.612	1.616	1.619	1.622	1.629	1.635	1.641		
225	18.745	0.0321	V*	0.017	0.920	0.91996	0.91996	0.92702	0.93409	0.94115	0.95526	0.96936	0.98345
	H	-87.6	56.15	56.15	56.83	56.83	57.51	58.19	59.58	60.97	62.38		
	S	1.145	1.608	1.608	1.611	1.614	1.617	1.624	1.630	1.636	1.641		
230	20.711	0.0332	V*	0.018	0.837	0.83733	0.83733	0.84375	0.85016	0.86298	0.87578	0.88858	
	H	-85.7	56.88	56.88	56.88	56.88	57.56	58.25	59.63	61.02	62.43		
	S	1.153	1.606	1.606	1.606	1.609	1.609	1.612	1.619	1.625	1.632		
235	22.849	0.0343	V*	0.018	0.763	0.76307	0.76307	0.76891	0.78057	0.79222	0.80385		
	H	-83.7	57.62	57.62	57.62	57.62	57.62	58.30	59.68	61.07	62.48		
	S	1.160	1.604	1.604	1.604	1.604	1.604	1.608	1.614	1.620	1.627		
240	25.174	0.0354	V*	0.018	0.696	0.696	0.696	0.69623	0.70686	0.71748	0.72808		
	H	-81.6	58.36	58.36	58.36	58.36	58.36	58.36	59.74	61.13	62.54		
	S	1.167	1.603	1.603	1.603	1.603	1.603	1.603	1.609	1.616	1.622		
245	27.697	0.0366	V*	0.018	0.636	0.636	0.636	0.636	0.6466	0.65055	0.66023		
	H	-79.6	59.11	59.11	59.11	59.11	59.11	59.11	59.61	61.20	62.60		
	S	1.175	1.601	1.601	1.601	1.601	1.601	1.601	1.604	1.611	1.617		
250	30.425	0.0378	V*	0.018	0.582	0.582	0.582	0.582	0.58180	0.59067	0.59952		
	H	-77.6	59.88	59.88	59.88	59.88	59.88	59.88	59.88	61.27	62.67		
	S	1.182	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.606	1.613		
255	33.395	0.0391	V*	0.018	0.533	0.533	0.533	0.533	0.533	0.53656	0.54467		
	H	-75.6	60.65	60.65	60.65	60.65	60.65	60.65	61.34	62.74			
	S	1.189	1.597	1.597	1.597	1.597	1.597	1.597	1.597	1.602	1.608		
260	36.591	0.0404	V*	0.018	0.489	0.489	0.489	0.489	0.489	0.48868	0.49559		
	H	-73.5	61.42	61.42	61.42	61.42	61.42	61.42	61.42	62.82			
	S	1.196	1.597	1.597	1.597	1.597	1.597	1.597	1.597	1.603	1.608		
265	40.045	0.0417	V*	0.018	0.448	0.448	0.448	0.448	0.448	0.448	0.45188		
	H	-71.4	62.21	62.21	62.21	62.21	62.21	62.21	62.21	62.91			
	S	1.203	1.596	1.596	1.596	1.596	1.596	1.596	1.596	1.599	1.604		
270	43.766	0.0431	V*	0.018	0.412	0.412	0.412	0.412	0.412	0.412	0.41206		
	H	-69.4	63.00	63.00	63.00	63.00	63.00	63.00	63.00	63.00	63.00		
	S	1.210	1.594	1.594	1.594	1.594	1.594	1.594	1.594	1.594	1.594		

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A-50 VAPOR (TEMPERATURES ABOVE PTP2)

DEW POINT TEMP	PRESS	LIQUID COMP.	LIQUID	VAPOR	SUPERHEAT REGION						
					TEMPERATURE: 275	280	285	290	295	300	305
215 15.290 0.0300	V*	0.017	1.115	1.21795	1.22253	1.23511	1.24369	1.25226	1.26083	1.26940	1.27796
	H	-91.6	54.71	63.00	63.72	64.43	65.15	65.88	66.60	67.33	68.06
	S	1.130	1.611	1.650	1.653	1.656	1.659	1.662	1.665	1.668	1.672
220 16.943 0.0311	V*	0.017	1.012	1.09759	1.10536	1.11312	1.12088	1.12863	1.13638	1.14413	1.15188
	H	-89.6	55.42	63.04	63.76	64.47	65.19	65.91	66.64	67.37	68.10
	S	1.138	1.609	1.645	1.646	1.651	1.654	1.657	1.660	1.663	1.667
225 18.745 0.0321	V*	0.017	0.920	0.99050	0.99753	1.00457	1.01160	1.01863	1.02565	1.03268	1.03970
	H	-87.6	56.15	63.09	63.80	64.52	65.23	65.96	66.68	67.41	68.16
	S	1.145	1.608	1.640	1.643	1.646	1.649	1.652	1.655	1.658	1.662
230 20.711 0.0332	V*	0.018	0.937	0.89497	0.90136	0.90775	0.91413	0.92051	0.92689	0.93326	0.93963
	H	-85.7	56.08	63.14	63.85	64.56	65.28	66.00	66.73	67.45	68.19
	S	1.153	1.606	1.635	1.638	1.641	1.644	1.647	1.651	1.654	1.657
235 22.849 0.0343	V*	0.018	0.763	0.80967	0.81548	0.82129	0.82709	0.83289	0.83869	0.84449	0.85028
	H	-83.7	57.62	63.19	63.90	64.61	65.33	66.05	66.78	67.50	68.23
	S	1.160	1.604	1.630	1.633	1.636	1.639	1.643	1.646	1.649	1.652
240 25.174 0.0354	V*	0.018	0.696	0.73338	0.73867	0.74396	0.74925	0.75453	0.75981	0.76509	0.77037
	H	-81.6	58.36	63.25	63.96	64.67	65.39	66.11	66.83	67.56	68.29
	S	1.167	1.603	1.625	1.628	1.632	1.635	1.638	1.641	1.644	1.647
245 27.697 0.0366	V*	0.018	0.636	0.66507	0.66990	0.67472	0.67955	0.68437	0.68919	0.69400	0.69882
	H	-79.6	59.11	63.31	64.02	64.73	65.45	66.17	66.89	67.62	68.35
	S	1.175	1.601	1.620	1.624	1.627	1.630	1.633	1.636	1.639	1.643
250 30.425 0.0378	V*	0.018	0.562	0.60394	0.60836	0.61277	0.61718	0.62159	0.62600	0.63040	0.63480
	H	-77.6	59.88	63.37	64.08	64.80	65.51	66.23	66.95	67.68	68.41
	S	1.182	1.600	1.616	1.619	1.622	1.625	1.628	1.632	1.635	1.638
255 33.395 0.0391	V*	0.018	0.533	0.54872	0.55276	0.55680	0.56084	0.56488	0.56891	0.57294	0.57696
	H	-75.6	60.65	63.45	64.16	64.87	65.58	66.30	67.02	67.75	68.48
	S	1.189	1.598	1.597	1.611	1.614	1.618	1.621	1.624	1.627	1.630
260 36.591 0.0404	V*	0.018	0.489	0.49931	0.50302	0.50673	0.51044	0.51414	0.51784	0.52153	0.52522
	H	-73.5	61.42	63.53	64.24	64.95	65.66	66.38	67.10	67.82	68.55
	S	1.196	1.597	1.597	1.607	1.610	1.613	1.616	1.619	1.622	1.626
265 40.045 0.0417	V*	0.018	0.449	0.45528	0.45867	0.46207	0.466498	0.46838	0.47178	0.47517	0.47857
	H	-71.4	62.21	63.61	64.32	65.03	65.75	66.46	67.16	67.91	68.63
	S	1.203	1.596	1.596	1.602	1.605	1.608	1.612	1.615	1.618	1.621
270 43.766 0.0431	V*	0.018	0.412	0.41519	0.41831	0.42143	0.42455	0.42767	0.43078	0.43389	0.43700
	H	-69.4	63.00	63.71	64.41	65.12	65.84	66.55	67.27	67.99	68.72
	S	1.210	1.594	1.594	1.601	1.604	1.607	1.610	1.613	1.617	1.620

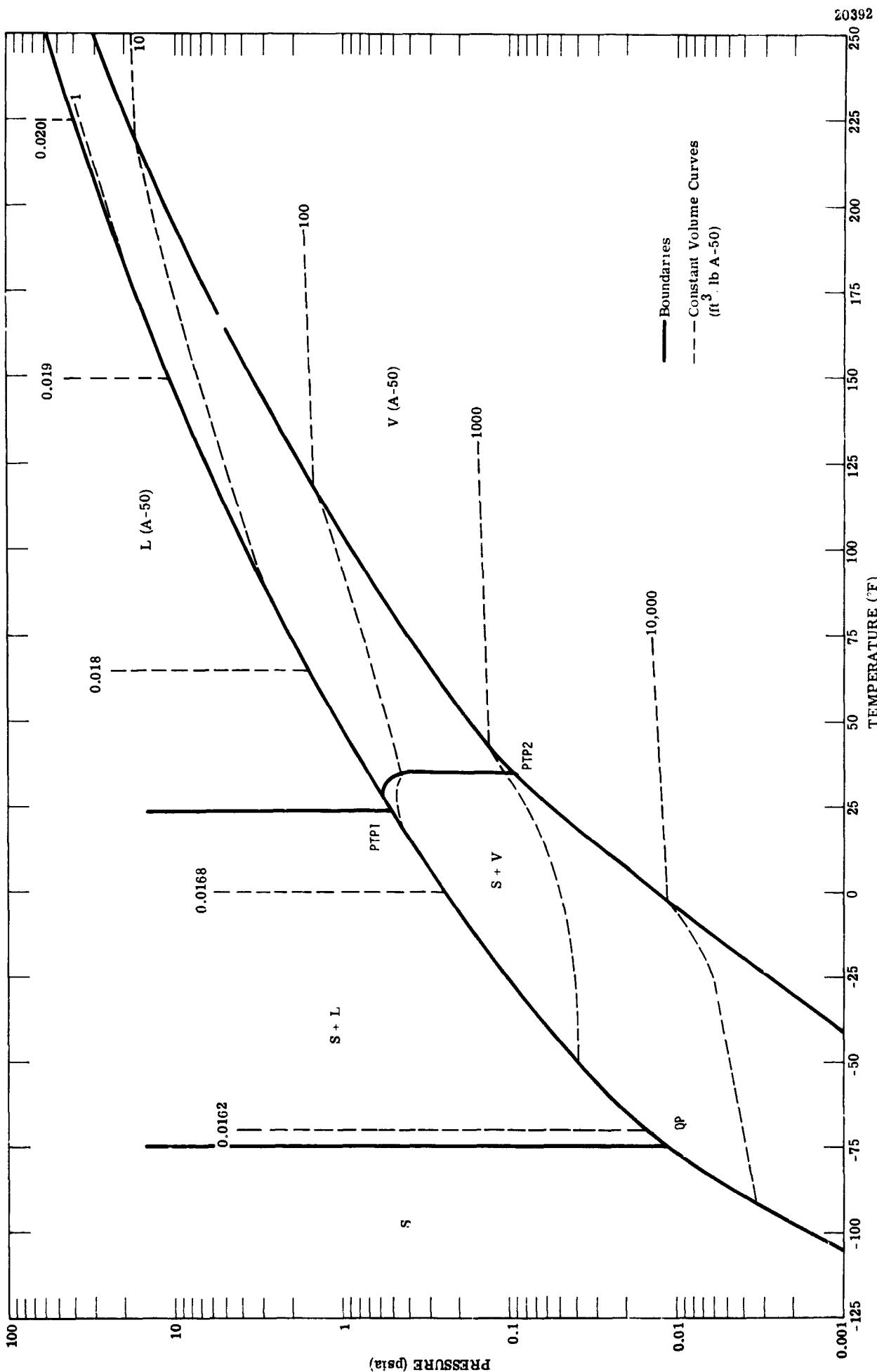


Figure D.1. Phase Diagram for Aerozine-50.

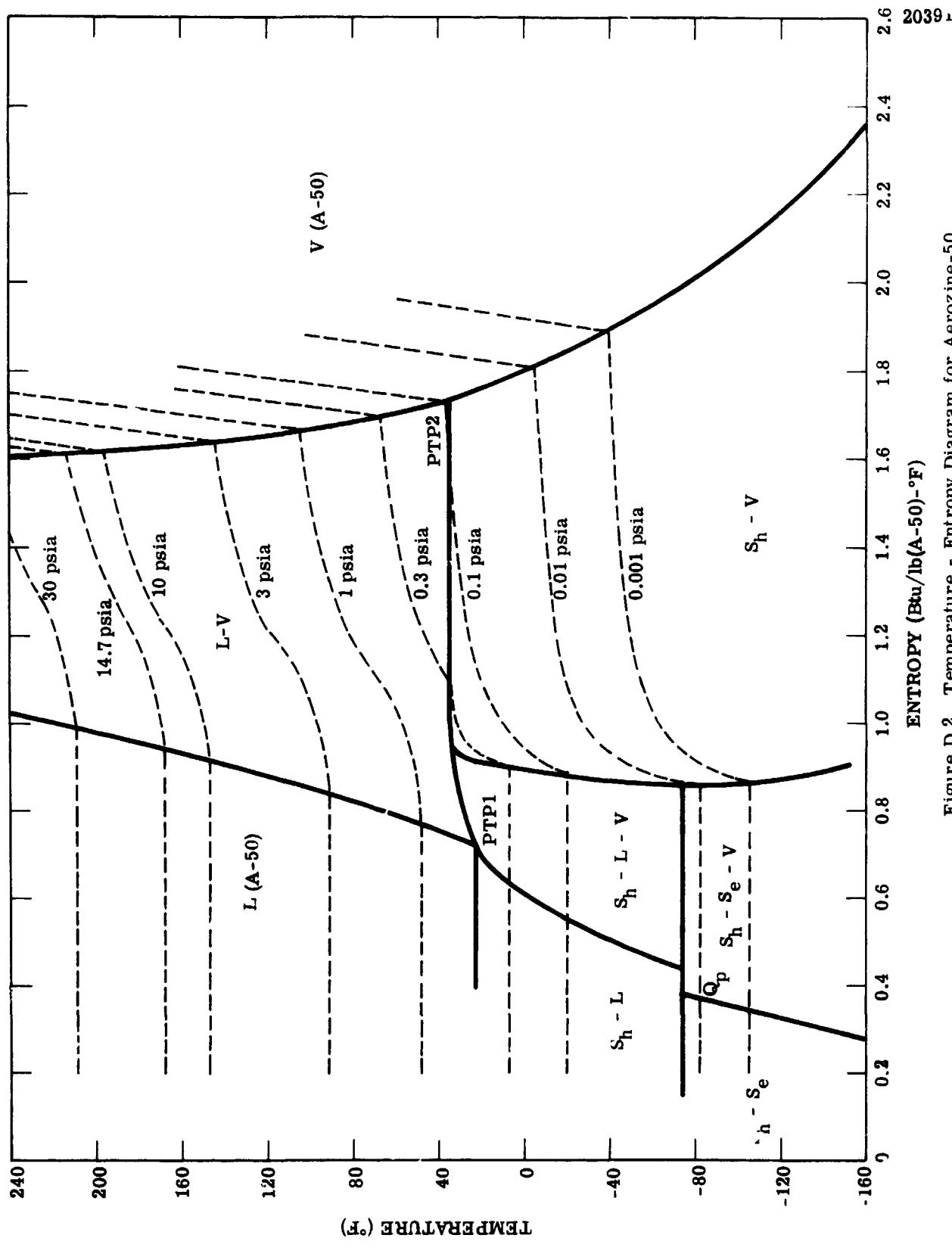


Figure D.2. Temperature - Entropy Diagram for Aerozine-50.

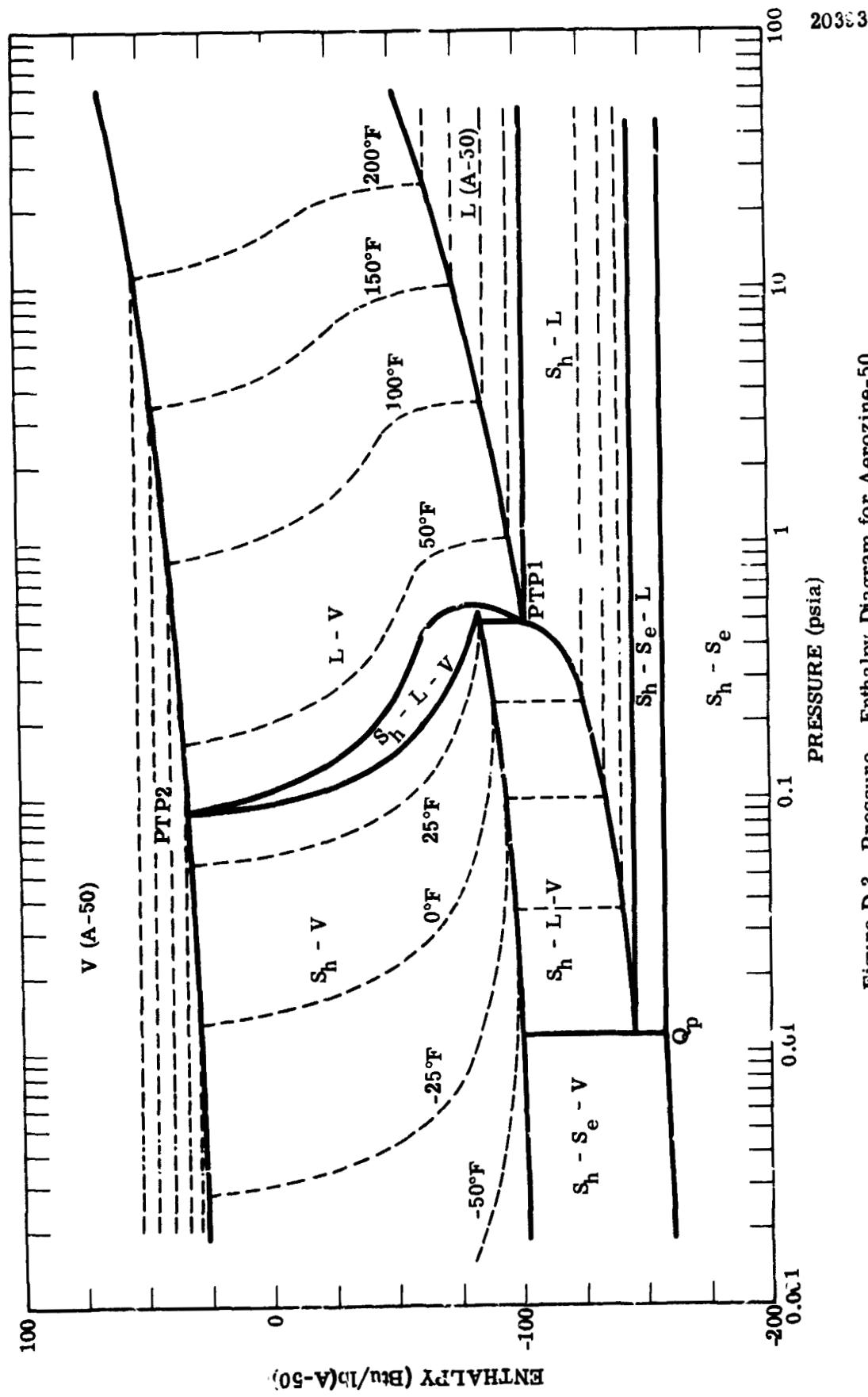


Figure D.3. Pressure - Enthalpy Diagram for Aerozine-50.

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